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INDUSTRIAL-ARTS MAGAZINE

Vol. VIII AUGUST, 1919 No. 8

The What and the Why of Manual Training

James McKinney, Assistant Professor of Industrial Education, University of Illinois

I TAKE it for granted that you are familiar with the introduction of manual training in the United States thru the Centennial Exhibition and the efforts of Prof. Runkle and Calvin Woodward. The first two stages of our work represented in the Russian and Sloyd systems occupied the field together in America from the early eighties to the later nineties.

The third stage or influence of artistic ideals came chiefly thru the arts and crafts movement.

The last and fourth stage is the effort to line manual training up with the industrial educational movement. This came to birth in the nineties and is still with us.

The Russian system has been characterized by President Hall as iron in its inflexibility and wooden in its intelligence. It was an attempt to teach the common process of wood and iron trades as processes, and manual training with the emphasis on the process was the first star to which we hitched our wagon.

The sloyd system, in the minds of its original promoters, had certain social values. It was an effort to reestablish a dying Swedish domestic industry. Among the educational values claimed by this system were the virtues of neatness, accuracy, carefulness, respect for labor and "squareness." It was based on a philosophy of social class distinction. The making of dish racks, boot jacks, coat hangers, potato mashers, cooking spoons, etc., was very proper for the children of the working people. These wooden spoons, etc., had a rather hard time in becoming a part of our American democracy; however, the "Americanized" sloyd has developed some good features about it. Its pedagogy is sound. Its statement of what it is trying to do is clear. It has been successful in carrying out this aim in its practice, altho it must be admitted that its product is still rather wooden.

Ruskin and Morris were the great exponents of the arts and crafts movement. Ruskin was an aristocrat; Morris a democrat; but they both saw the need to establish that social conscience that would restore joy to production and beauty to the things we have made as the necessities of our life. Here was a real cause for manual training and we saw manual training enthusiasts curse the machine and all its products as low and debasing, and raise a hue and cry for the simple life and a return to the honest sweat of the handsaw and the plane. Things made by the hand seemed to carry a guarantee of beauty and honesty, and in our efforts to make honest pieces of craftsmanship we made furniture that needed the strength of a piano mover to change the position of a chair or a table.

Another reason why manual training teachers "fell" for the craftsman's furniture was because it looked easy to make and produced a good effect in the halls of an exhibition, and many teachers ignorant of the gospel that Morris, Ruskin, and Stickley preached, really did harm to the cause of manual training and the arts and crafts movement. You, no doubt, have seen many of these socalled craftsman's products of the school shop with all the earmarks of the feed roller of a machine planer showing thru a muddy stain and a greasy finish.

In attempting to hitch on to the new star of industrial education, manual training has, so far, had a rather bad time in getting aboard the wagon, with the result that there is still considerable distance between the wagon and the star.

In making this rough sketch of the growth and development, we have left out many of the other values that have been claimed by manual training, as from the nature of its work manual training can really put up a good claim for anything and everything in educational values. Manual training has been ever ready to align itself with new educational theories. This has come about thru manual training being free from any hidebound traditions, and therefore a very fertile field for the pedagog who wanted to try out once more some old theory under a new name. We have played many tunes on this same old harp of tool tricks. It has in turn been the psycho-physical idea, the epoch culture theory, cultural development, art interests, the social and ethical idea, trade skill, the development of mechanical and technical interests, and correlation to the whole of the educational program both inside and outside of the school. As Emerson once said, there is some value in being a non-conformist, but we have carried this doctrine to such an extent that the rank and file of our profession are rather apt to make a searching inquiry (after the lusty manner of our doughboys) and ask, "Where do we go from here?"

What we really need, from time to time, is a restatement of some fundamentals of the educational process and our part in them. In our chase for the new season's latest model, we are apt to forget that the human mind is a living process that unfolds according to its own laws.

1. That the little folks whom we are calling dullards may surprise us some day with latent powers which we were too blind to see.

2. That the most successful teachers are those whose methods grow out of the nature of the children, instead of being wholly manufactured outside of a classroom.

3. While it is valuable for the educator to note the racial characteristics of a child, it is much more important that he enter so completely into the lives of his students that he may discern each new change as it emerges.

4. The dominant sin of teachers is to make children homogeneous.

5. To meet the needs of our children, we must be able to read the impulses of their minds.

6. The psychological moment for giving information is when it is asked for.

7. The school may not have produced many poets, scientists, law makers or mechanics, but it has certainly tried hard to make our children all meet the entrance requirements of the next "higher" educational institution and—failed miserably in doing this job.

8. Progress is not continuous and steady.

9. Intellectual growth moves by leaps and bounds, with rests between.

10. These periods of apparent starvation (which generally mean demotion for the child) are often the points at which most progress is made.

It is hard to put the keystone of John Dewey's education into a single paragraph, but I have at least learned this from him: Education means getting experience in a natural way. As children we work and play as children; as youths we work and play after the manner of young people; and when we become men we put away the childish things. It is the teacher's job to discover the instincts, interests and capacities as they unfold and direct them to an educational end. We gradually learn to behave thru gaining control of our impulses. This control becomes easier as we know more about the facts and conditions of our environment and the worth of our fellows.

This swaying of manual training practices and its jumping from doing this and that shop trick or stunt, has been largely due to an indefiniteness of aim. I find a very few supervisors and a still smaller number of the rank and file of manual training teachers who can offhand tell you clearly the aim of their work.

About ten years ago, Mr. Frank W. Ballou wrote an essay upon the present status of manual training in the public schools of the United States, in which he presented data collected from 330 cities of several important problems relating to manual training. Of the 330 cities, 215 claimed to have introduced it for pedagogical reasons, and fifty rather truthfully and frankly said it was in the school because of a popular demand.

In 1916, Joseph C. Park and Charles L. Harlan made another similar study covering 156 cities, and the report is published by the Bureau of Education as Bulletin 1916, No. 32, and is worth the study of all manual training teachers. On the question of aim, we find out of 112 cities which sent replies, 50 per cent claim their aim as prevocational, 39 per cent cultural, 11 per cent as vocational. To show how loose and off-hand some of these statements are, we have only to consult what these schools were teaching. A study of the kind of work taught, shows that in the seventh grade, 93 cities were giving what is called joinery and cabinetmaking, and in the eighth grade, 98 cities were giving these same trade practices. This same form of work predominates in the first year of the high school, and it is only in the three remaining years of high school when the number of students have been reduced by almost half the original number, that we see anything that looks like a prevocational study, as the trades of foundry practice, pattern-making, and machine shop have been added. In passing it will be noted that calling the woodwork of the elementary schools joinery and cabinetmaking is sure to help in this confusion of aim, and also misinform a large number of tradesmen who are practicing these trades, and invite just criticism from them on the basis that this job is being poorly done. Paper folding is the dominant activity for young children. Joinery and cabinetmaking is the big factor in boys' work in the grades and high school. Cooking and sewing is the big factor in girls' work in the grades and high school. On what basis these good people determined that this work was providing an experience that would help to make an intelligent choice of our great variety of occupations, I frankly do not know; nor is there indication on what basis they determine for saying that the work had a cultural value, unless it be on the basis of that old whiz of developing squareness by continual use of the try square; and I must confess ignorance of the means used to determine that eleven per cent were getting specific trade training, unless it be the fact that systematic graded exercises were given in really all of this socalled joinery and cabinetmaking work.

A still more recent survey has just come to my notice. Four years ago at the convention of the Eastern Arts Association, the School Crafts Club of New York proposed the formation of a committee to study the work of our schools that was passing by in the name of manual training, prevocational and industrial education, and determine just what the aim and purpose of these activities were. The Boston Manual Training Club was assigned to the manual training study, and the School Crafts Club of New York was given the prevocational problem. Last year, at the annual meeting of the association at New Haven, Conn., the Boston Manual Training Club turned in its report. The questionnaire which was sent out contained a few simple questions, and one of them touched this very vital point of "Why are you doing this kind of work?" The New England conscience may have had some effect on the answers received, as there is an awful silence to that searching question. So few people had the courage or conviction to answer this question that little information was gained on this important point. When you don't know, silence is golden. There is always the possibility of the

other fellow giving you the benefit of the doubt. To me it is very suggestive that the teachers in the territory covered by the Eastern Arts Association should be silent on this question, and it brings home the need for a restatement of our aims and purposes.

First, let us keep in mind that man is a tool using animal, that it has been a part of our natural development to make tools and fashion the raw material of nature into the necessities and conveniences of our life. That industry or work is our heritage and portion and by far the biggest factor in our lives.

Second, to quote John Dewey, "Children have their observations and thoughts mainly directed towards people, what they do, how they behave, what they are occupied with, and what becomes of it." Here are the basic facts that put manual training on the educational program. This statement has not referred to the many values that manual training has gathered around its work, but on close study it will be noted that it does include all the psychological, pedagogical and social values.

The next important question is naturally, What shall be the medium or material used in carrying out our program of work? Shall it be in wood, metal, cement, printing, etc.? Shall the methods used be those of a modern workshop or a simpler hand crafts period? Before we can adequately answer these questions, we have to recognize some of the fundamental laws regarding the acquisition of experience. We have to recognize the elements of child study and the periods of development. In this connection, we might note that the work of the primary grades cannot be the same as the high school because the tool work of the primary schools is largely a *method* of instruction and along with other forms of manual training forms the basis for giving the necessary initial motor and sensory experiences.

As we get into the formative period of a boy's life, say, from 8 to 12 years, manual training takes on an aspect of a *subject*. Your boy is beginning to become more and more interested in *what men* are doing and *why* they are doing it. We will have to study these interests closely if we are to make full use of them for educational ends. The only reason that I have been able to conjecture, so far, why the woodworking trades have been selected as the medium for manual training work in the elementary school is that it belongs to one of the four fundamental tool using processes. The carpenter, the blacksmith, the molder, and the machinist have always been with us in some form. Why working in wood was selected in preference to the other crafts I am not altogether sure, unless it be the fact that it was selected on the basis of being clean work and at one time wood was inexpensive and easy to get.

Another fundamental error in the selection of our manual training shop practice has been the fact that the average teacher has thought of every boy as belonging to, what I call, a mechanical type. However, those of us who have given the matter any observation are sure to have discovered that we still have some of the "all thumb" type of individuals with us; they are the boys who never succeed in getting any woodworking problem farther than the scrap box.

In the high school your boy is approaching adult life; physically, he grows and grows; mentally, he sometimes is wide awake and sometimes fast asleep, and he needs that touch with the real and concrete problems of the shop. Manual training should now begin to take on the *over-alls and trade practices of the trade, but it has not yet taken on trade training as its aim.* It should provide for the boy an experience in the fundamental trade processes after the fashion of how men actually do this job.

Socially, manual training ought to be the means for vocational guidance. Thru it the student ought to be introduced to labor and the great fields of industry.

It might be possible for a supervisor or teacher to have lived to the letter of this law from his youth up and yet fail because of the lack of the one essential thing regarding any educational process. Not having any definite aim in mind with regard to our work, it is very possible to have a rather hetrogeneous type of work going on. I sometimes wonder about the real value of our shop problems as they appear in the columns of our professional magazines where we can get the new season's latest model. Many of our courses, I am afraid, have been built up just in this way, by recognizing a fine model that someone else has made and simply copying this without any thought of why we are putting this into the course. Again, the best type of work can be practically void of any educational value if it is put up on the basis of simply turning out fine looking work. The real educational values of manual training are, after all, often to be found in the scrapboxes of the work shops rather than in the halls of an exhibition. The piece of work rather badly done but which shows all the ear marks of a boy living and wrestling with the problem is to him of very much greater value than anything he could have made under the teacher's careful eye, who never allowed a slip-up to be made and where every piece of work was O. K.'d only after the continual questioning on the part of the boy to find out what would really satisfy *the teacher.*

Again, I want to emphasize these two important things. A clear statement of what we are doing, and why we are doing it this way. I will leave you with four examples of what I call a well-rounded course of manual training. Three are connected with public school systems, one is connected with a well known private school.

In one of the public school courses of study, the aim is very clearly set forth in the following paragraphs:[1]

1. *To give some skill in the use of common tools.* This is of value to practically everyone, tho in a varying degree.

2. *To give a perspective view of the industrial world.* With the present rate of industrial develop-

[1]Jersey City, N. J. Supervisor D. E. B. Kent.

ment, no education can rank even as cultural in any serious sense, which does not include earnest effort to develop an appreciation of industry in its broader lines, i. e., as merely cultural subjects and quite apart from their vocational significance, the methods, materials, processes and problems of industry must have a large place in present day education. Acquaintance with these must precede any real appreciation of natural science as a factor in modern progress and of the vast social problems which are being created by industrial organization.

3. *To develop social adaptiveness—the power to participate effectively in group activities.* Appreciation of the world's work does not always include effectiveness in the work itself. The school shop must not only give knowledge about industries, it must also, since it may reproduce the conditions of the outside world much more closely than is possible in the regular schoolroom, accept a peculiar responsibility—along with the playground—for the cultivation of social habits and co-operative efficiency.

4. *To assist pupils in an intelligent choice of a lifework.* This aim is much more important than current practice recognizes, if not indeed the most important of all. The facts here are, briefly, that the choice of vocation is usually the most momentous decision of the whole life; that the great majority make selection at an early age; that the selection is ordinarily a matter of chance and temporary expediency rather than the embodiment of a deliberate judgment regarding one's special lines of ability; that, apart from the shop, the school tends to send a boy out with strong bias towards commerce and away from the industries; and that the school shops, therefore, represent the one chance under the conditions of modern city life for the boy with latent mechanical aptitudes to "find himself."

The elementary shop course is usually limited to woodworking in a fashion no longer justified by industrial conditions. Wood is rapidly losing its rank as a constructive material in these days of steel frame buildings, metal filing cabinets and reinforced concrete telegraph poles, and it is therefore of great importance to introduce the pupil to a number of the more fundamental industries. The practical suggestions below represent an attempt to secure this variety of experience so far as practicable with an equipment intended for woodworking. It is hoped that before long public opinion will justify equipments sufficiently diversified to permit their treatment in a more intensive way. It is becoming more and more clear that a boy may be a total failure at cabinet making and yet be capable of marked success as plumber, electrician, machinist or engineer—and equally, even if the aim be purely cultural, the pupil's industrial viewpoint should be broadened beyond the field of woodworking thru contact with these other great industries.

Of the four terms' work each has a somewhat distinctive aim. The first (Grade 7A) serves as a general introduction to woodworking and its common tools. The two following terms are given so far as possible to briefer treatment of a variety of industries, the first of these, (7B) treating of the building trades, as relating most closely to the woodwork of the previous term. The following term attacks in the same brief way certain lines distinctly different in type, such as the machine and electrical industries, while in the final term woodworking is treated in a far more intensive way than heretofore and with more of technical requirements than in any previous work—this is in the belief that brief and somewhat crude experience with these various industries should be supplemented at the end by a fixed attention to some one subject with a much closer approach to its mastery. The time allowance is one and one-half hours per week thruout the two years.

[2]A second school states this proposition, as an element of liberal education it is part of the function of manual training to aid in interpreting the industrial world. The industries are the foundations of our institutions and they constitute the main essential activities that men are engaged in, and a study of these activities is certainly important enough to have a place in the curriculum. The purpose of our study is to give a general industrial knowledge or insight. The subject shall deal only with the most typical features of the more important industries, and the aim shall be to develop a broad sympathetic appreciation of many phases of industrial life and their relation to the social world. With this ideal in mind, this school system gives an insight into modern factory practices, brings in the use of jigs, puts up problems to its boys in inventing all the devices possible to insure an accurate product with the least amount of effort. A second phase of the work is illustrated in the school work shop in what might be termed group or gang work. The following problems answer these requirements. A one-story house large enough for boys to get inside and do necessary sawing and nailing; metal bridges, concrete, iron, or wooden looms, boats, or large furniture for the school. In summarizing the values this supervisor says:

1. All problems must be selected for their industrial significance.

2. Opportunity must be provided for work in more than one material.

3. The factory and group system of production should be illustrated.

4. Labor saving machinery should be employed.

5. Visits to factories and construction work should be systematically made.

6. Shop, library and museum should be maintained.

[3]Another public school states its aims for practical arts work under the following:

1. Introducing considerable practical experience in connection with school work.

2. Establishing the application of classroom studies to the concrete situation in the practical work.

[2]New York City. Supervisor W. A. Garritt.
[3]Springfield, Mass. Supervisor E. E. MacNary.

3. Giving a tryout experience in a number of activities as a test of the natural inclination of the pupil and to assist the boy to find himself.

4. Make it possible for a pupil to prepare himself for high school or for employment by selecting a course and that approximates his needs.

This work is in no sense a trade training that is offered, nor is it intended as a feeder for the vocational school.

Shop experience. This work consists in experiences in carpentry, cabinetmaking, metal work, printing, cement and concrete, electrical work and clerical work.

[4]The fourth, and last example, is from a private school.

In the statement of its aim with regard to manual training work, this school brings out the fact that the development of the tool arts has been parallel with most of the fundamental traits of human nature and genius, and it is on this principle that the subject matter of the course has been developed. It further states, that the manual arts work must recognize and give a just consideration to both the motor and idea sides, the technical and social content, to the crafts and mechanic aspects, to the art and the science of the workshop, and finally, the industrial and humanistic significance of the work.

The subject matter in various grades of the elementary school is concerned with the studies of various kinds, as for instance, in the fifth grade a study of the evolution of timepieces is carried out. Shadow sticks, quadrants, sun dials and water clocks are designed and constructed. In the sixth grade, the shopwork is devoted to the simple study of industrial mechanics as is seen in building construction, bridges, elevated structures and the like. The simple truss is studied and tests are made to demonstrate the various kinds of stresses and strains which structures undergo. In the seventh grade, the practical construction work is done in connection with the study of the fundamental problems involved in the use of water, wind, steam and electrical power in the development of industry. The vital interests of the study are in its history, physics, mechanics, and problems in constructive design, drawing and toolwork. In the eighth grade, there is a choice of subject matter based on the needs of two types of students who are classed as the mechanical and non-mechanical type. Here one group takes up the study of the steam engine, while another group chooses printing. In these various studies the actual shopwork gradually increases in the standard of technique required and this is largely brought about by the demands of the work itself. In working out these problems the boys are coming in contact with a great variety of materials and getting experience in working in wood, tin, brass, iron and lead, and also in an elementary way touch upon the four fundamental processes of woodworking, pattern making, moulding and machine shop.

In each of these cases just cited, you will note that before a new model can be introduced into the course some thought has to be given as to why it is put in and why it has been carried out in a certain particular way. It will also be noted that these courses all have a definite vocational guidance value and yet no one of them claim that they are doing vocational work. The lack of clearness on the part of our aim of manual training has led us into all kinds of extravagant claims. There should be absolutely no quarrel between the work of the industrial trade teacher and the manual training teacher. Their work cannot be compared because their aims are different and their standards are different. Those of us, who have been clear about what manual training has been trying to do, have no quarrel with the challenge of the vocational teachers that we were not doing a thoro trade training job. The fact is, we are not. This is not the function of manual training and we have no apologies to offer on this point. It is only when our work settles down into one narrow type of experience that we are running risks of being criticized for doing a poor piece of trade training in that particular craft. Generally these criticisms are well founded as no manual training course has sufficient time allowed for its practice to carry on a thoro trade training course.

A course in manual training might be made out from two or three points of view. In an industrial center it might take its cue from the industries around it. In a rural community it might take its interests from the homes of its children, but in a larger and broader way than that of mere woodworking; it could extend its work to cover any of the problems of the upkeep and repair of the home and the farm. On whatever basis a manual training course for the elementary school is established, the one important thing to keep in mind is first, that a clear statement of its aim be the first essential; second, that a real effort is being made to carry out that aim; third, that in the actual shop practice itself the teacher shall discriminate between giving information, showing tool tricks, and actually developing intelligence. The development of intelligence can only come from solving the problems, and therefore, our work should be put up almost entirely from the problem or project point of view. If we carry out this point of view we shall have made a good start to provide industry and the profession with the thing in which we are sadly lacking, people who think while they work and who can discover problems for the exercise of their intellect even in the most routine tasks.

[4]The Ethical Culture School, New York City, A. W. Richard, Director.

NOT until the term artisan has come to be as honorable as the term artist, will we have real freedom.

—*Bliss Carman.*

THE JUNIOR RED CROSS TURNS THE TABLES

Julia C. Coburn

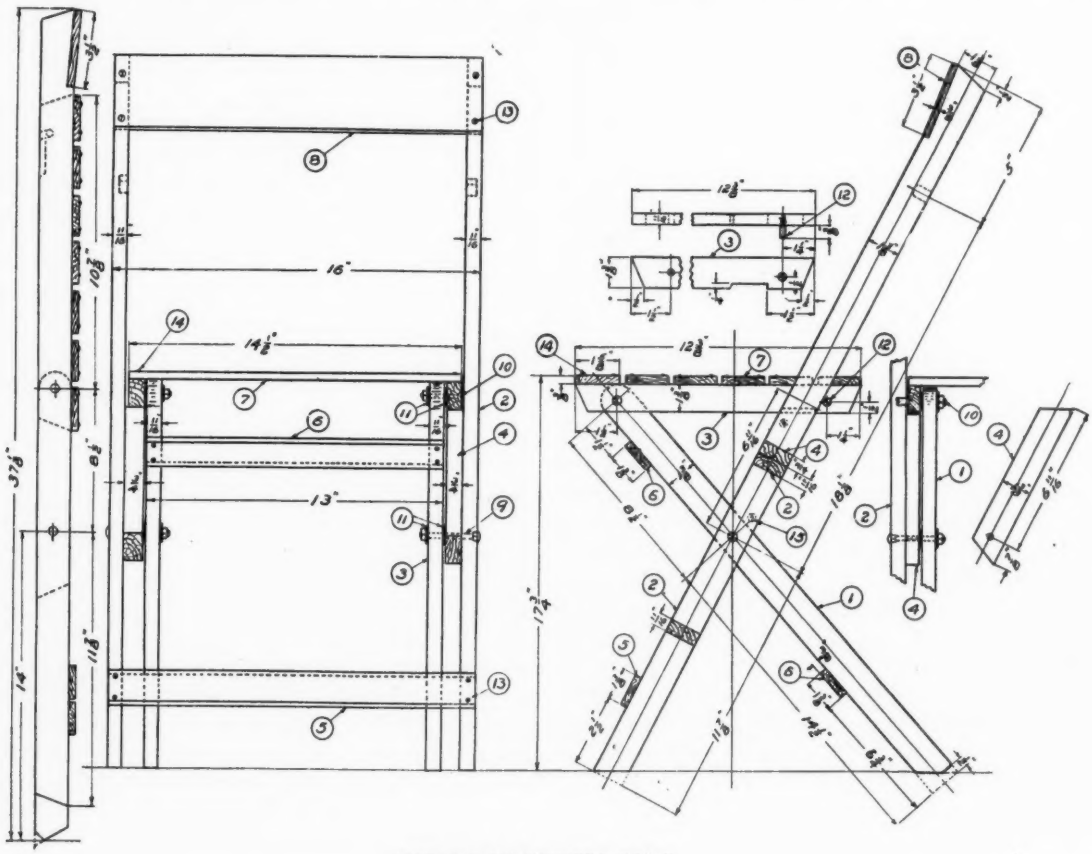
THE boy army whose drilling has been in blocks of wood and whose drives have been focused upon nails, have not been included in the epidemic of demobilization. In fact, it begins to look as if they were becoming "regulars."

Right on the heels of the armistice, to the Junior Red Cross boys in the school workshops there came a new manual training job. Thirty thousand chairs and ten thousand tables for overseas service in the new homes in devastated districts of France was the order. It came to the Red Cross from the French government, for the Red Cross is assisting in the work of reconstruction.

It may seem like far-fetching to bring tables and chairs from Oregon and California workshops to French firesides, but there's a reason. Innocent non-combatant furniture — several million dollars' worth — shared in the German passion for destruction, and 1,200,000 acres of valuable forest land went the same way. France lost nearly ten per cent of its timber. The result is that France has neither enough furniture, enough wood to make more, nor enough men to do the work. Someone estimated recently that with no building going on elsewhere, and two-thirds of the building-tradesmen in France available for work in devastated regions, fifteen years would be required for the rebuilding alone.

So here the Junior Red Cross, with plenty of wood available, and what is more, plenty of eager labor, was put to work. The cable from France said that the furniture should be shipped knocked down, so that it could be set up by unskilled labor at its destination. Mr. Fred W. Boland, of Pittsburgh, who has been successful in designing all the Junior Red Cross furniture, did another noteworthy job on these tables and chairs. The table is of simple design, with legs that unscrew and remove, for shipping, but can be adjusted in a minute. The chair folds until it is absolutely flat and not more than two inches in thickness. Three chairs, collapsed, are packed inside the box of the table, two tables are placed top to top, and they are crated two tables and six chairs to a unit.

Altho the specifications and allotments for this furniture were not sent out until near the end of the school year, many schools completed enough of the work to make a creditable first shipment in June. In some



DETAILS OF REFUGEE CHAIR.
(See Specifications on Page 301.)

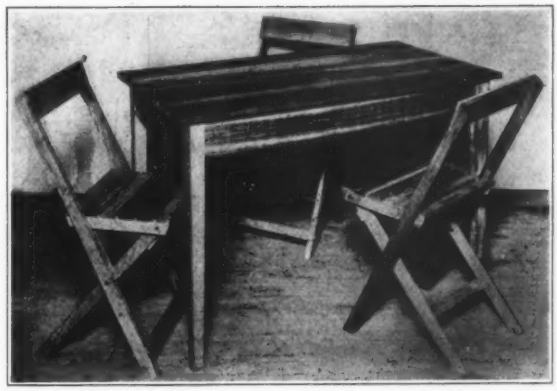
places, it will be found practicable to continue the work this summer. Last summer in six weeks 75 bedside tables were turned out in one school by "green" boys who were taking industrial training for the first time. Next fall, however, is when the school shops will have the opportunity to make a spectacular finish on this order. The entire 40,000 articles are to be completed by December 1. From the enthusiasm evinced so far, there is little doubt of success. Some schools completed their allotments in one month in the spring and demanded new ones. In the fall, schools which have not previously done Junior Red Cross work, or have not taken part in the furniture-making, will be joining their ranks and requiring quotas.

Manual training instructors like this work. And their boys like it. One enterprising instructor took a vote as to preference when this latest order came in. "Now boys," said he, "you can put your patriotism aside and vote frankly whether you'd rather do the Junior Red Cross work or go back to the regular things we were making before this came up." The vote was taken. In one class 95 per cent of the boys voted for the Red Cross furniture, 80 per cent in another, and in a third, an advanced class which ordinarily did designing and original work, 65 per cent.

The reasons for the preference vary. To some, this work is mechanically more interesting. One boy candidly admitted that it was easier. Those who secretly feel a thrill in the making of furniture that will help make it easier for our French friends to take up homelife again, are slow to admit it. Boys would not be boys if they dilated upon the altruistic value of their work. And yet the unselfish spirit is there. "Which would you rather do," one boy was asked, as he pounded nails into the seat of a chair, "Junior Red Cross work or the kind you did before the war?" "You mean our own stuff?" he asked. "Yes." "Oh," said he emphatically, "this!" And he gave the nail a strike which left no doubt.

Another boy was thinking of the bread-upon-the-waters idea. He made little response when the picture of a French family having a comfortable meal with the tables and chairs was graphically portrayed to him.

BOYS OF THE SNODGRASS SCHOOL, PITTSBURGH, FINISHING RED CROSS CHAIRS.



A UNIT OF RED CROSS REFUGEE FURNITURE.

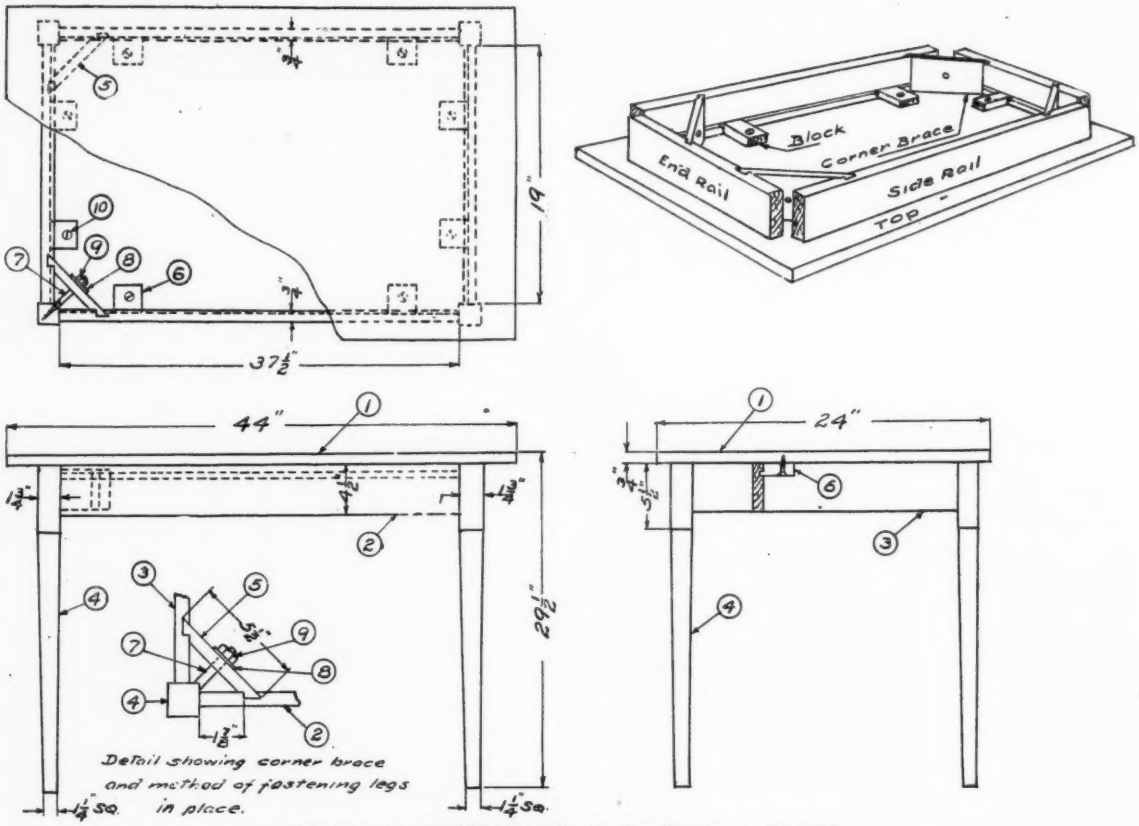
He had his own idea of the occasion. "Yep," he added eagerly, "and some day when we get poverty struck we might go over there and eat off 'em!"

The making of these tables and chairs challenges the ingenuity of both teachers and pupils, and jigs for standardizing the various operations and speeding up production are the rule. While the jigs are usually planned by the instructor, the boys often make suggestions and do the actual construction. The use of jigs also enables schools with less equipment to turn out products quite up to those made in the most up-to-the-minute shops. A grammar school in Pittsburgh had to have its table tops planed by the machinery in one of the high schools, but from that point this school made chairs and tables which were perfect in every way. They were being made by sixth, seventh and eighth grade boys taking their first shop work. In a small shop but with an instructor whose ingenuity and enthusiasm would overcome any obstacles, they had completed ten tables and thirty chairs within a month after they had received their quotas in the spring.

Instructors believe that experience in shop work is not necessary for accurate production on this order. Paying attention and following orders are the prime requirements. Thus the same characteristics which have made American boys good military soldiers are making their younger brothers good shop soldiers. The chair is a self-inspector, because any slight error, even varnish applied a little too thick, causes it to fail to fold up. Then correction must be made.

And yet there is very little waste. The operations are so standardized as to be almost fool-proof. "We eliminate the human element so far as possible, and thus avoid errors," the instructors say. The originality and initiative of the boys find their places in the construction of jigs and the inventing of new means of doing the work. But the actual operations are performed with the single idea of uniformity. A grammar school instructor showed the pile of waste which had accumulated during the making of the refugee furniture. It would hardly be sufficient to furnish kindling for a single fire!

A clever device makes the furniture for France a product of the hearts of America's children as well as of



DETAILS OF REFUGEE TABLE. See Specifications on Page 301.

their hands. A high school French class wrote a letter of greeting to the French people who are to receive the furniture. This has been printed and is distributed with the specifications. An envelope containing this letter, signed by the name of the school sending the gift, with its location, is tacked securely to each table top before it is crated. In the envelope is also a postal card, addressed to the school. On this card the French recipient is to sign his name and the date, returning the card to the school as a sign that it has found its place in its new home. Schools will treasure these cards as actual souvenirs of the friendly relation they have established with French people by actual work on their part. And sixty years from now, old men and women in France may be proudly showing their grandchildren chairs and tables sent them by the American Junior Red Cross in 1919, now heirlooms; this furniture, and the printed letter which accompanied it, with a Red Cross at the top, all creased and yellow with age. They bid their grandchildren cherish these souvenirs as long as the well-driven nails and the strong grooves hold. For American boys, now old men too, drove those nails and cut those grooves, and sent this their tangible expression of sympathy and admiration for hardships endured, and a gesture of hope for the future.

Manual training instructors are now looking back over a year and a half of Junior Red Cross service, and it makes a magnificent showing. From the time when the boys made knitting needles spontaneously, thru the large national orders that followed, one for over 4,000 articles of furniture for the Red Cross Convalescent Houses at hospitals in this country; another for 236,000 articles for the Field Medical Supply Depot of the Army,—splints, bedside tables, and several kinds of chests; and now thru 40,000 pieces of furniture for new refugee homes in France—the spirit of doing a worthwhile job just right and on time has been the spirit—and it is the manual training instructors as leaders who have contributed perhaps more than the boys to this spirit. "Whenever there's a Red Cross job to be

RED CROSS FURNITURE IN THE SHOPS OF THE CENTRAL HIGH SCHOOL, MINNEAPOLIS.
Taken in 1918.

done, we set aside everything else on hand and do it," is the way they put it. One Colorado instructor was worried for fear his quota of bedside tables would not get completed on time when the schools were suddenly closed last fall. So he spent his enforced vacation in finishing up the entire allotment, single-handed.

It was work done in this spirit of devotion that elicited the following spontaneous tribute from the officer-in-charge of the Medical Corps, for which the largest order was turned out: "The work turned out so far has been of a very high quality; in fact, the best, so far as my experience goes, that has ever come to the Depot."

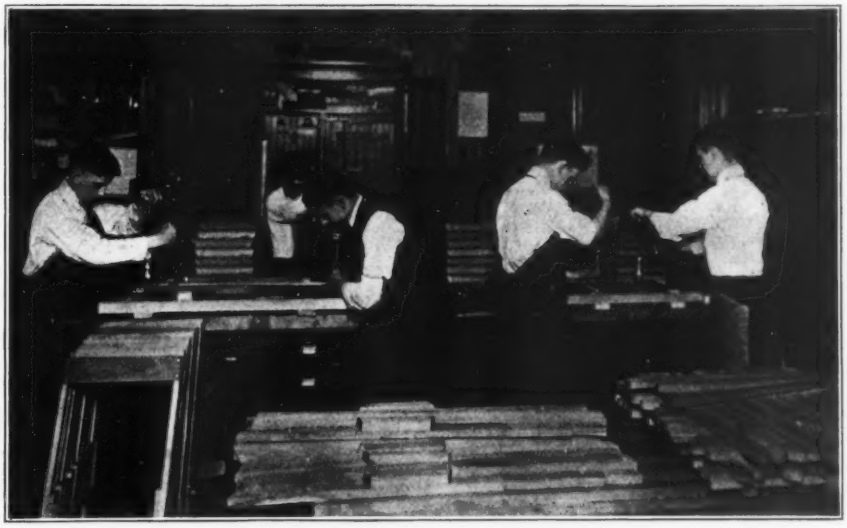
5	Corner Brace	¾″	4″	5½″	4
6	Block	¾″	2″	2¼″	8
7	Hand Rail Screw...	$\frac{5}{16}$″		4″	4
8	Washer	$\frac{5}{16}$″			4
9	Nut	$\frac{5}{16}$″			4
10	Screw	1¼″ No. 9, F. H. B.			8

Finish—Stock should be dressed with smooth plane and sanded smooth with No. 1 sand paper.

If the table is made of pine, poplar, redwood or birch it is to be stained mahogany; if made of oak or ash it is to be stained with light, fumed or mission oak stain. Table should be given one coat of shellac and one coat of varnish. All work must be done in a first-class manner, strictly in accordance with the specifications and drawings.

Refugee Chair.

Quality and Kind of Lumber—This chair may be constructed of any suitable straight-grained hardwood, as birch, maple, ash or oak.



QUANTITY PRODUCTION OF RED CROSS REFUGEE FURNITURE WITH THE AID OF JIGS. FIFTH AVENUE HIGH SCHOOL, PITTSBURGH, PA.

Since the armistice, there has been no chafing to get back to the pre-war shopwork. The reception of the refugee furniture order has proved that; and Mr. Boland, in Pittsburgh, already has his wits to work on new shop problems for Junior Red Cross boys after the war and reconstruction needs are all met. He says he doesn't want boys to go back to working only on the taboret-bookrack-for-Mother bases. And many instructors declare that war work has put a motive into shopwork which never could have been infused otherwise.

Refugee Table.

Quality and Kinds of Lumber—This table may be constructed of any of the following woods: White pine, poplar, California redwood, birch, ash, oak or other suitable woods, free from knots and other defects that would impair its usefulness.

Construction—The rails are to be fastened together at corners with corner braces. The braces are to be dovetailed into the rails as shown on the drawing. The top is to be fastened to rails with blocks as shown and the legs to be held in place with handrail screws. The top to be made up of not less than three (3) pieces, accurately jointed and glued together.

Bill of Materials.

Item	Name	Size T.	W.	L.	Reqd.
1	Top	¾″	24″	44″	1
2	Side Rail	¾″	4½″	37½″	2
3	End Rail	¾″	4½″	19″	2
4	Leg	1¾″	1¾″	28¾″	4

Legs—The legs are fastened together by means of stretchers, glued and screwed in place with ⅞″ No. 6 F. H. B. wood screws. The legs are pivoted on ¼″ diameter carriage bolts, as indicated on drawing. The back rest is securely glued and screwed to legs with four ⅞″ No. 6 F. H. B. wood screws. Notches are cut in legs 18¼″ from center of pivot; these notches are to accommodate guide screws, as shown on drawing.

Bill of Materials.

Item	Name	Size	Reqd.
1	Leg	$\frac{11}{16}$ x 1⅜ x 23¾″	2
2	Leg	$\frac{11}{16}$ x 1⅜ x 35″	2
3	Batten	$\frac{11}{16}$ x 1⅜ x 12⅜″	2
4	Seat Support	¾ x 1⅜ x 7$\frac{5}{16}$″	2
5	Stretcher	⅜ x 1⅜ x 16″	1
6	Stretcher	⅜ x 1⅜ x 13″	2
7	Slats	⅜ x 1⅝ x 13″	6
8	Back Rest	⅜ x 3½ x 16″	1
9	Carriage Bolts	¼″ diam. x 2½″ long	2
10	Tire Bolts	¼″ diam. x 1¾″ long	2
11	Steel Washers	¼″ diam.	8
12	Headless Steel Wood Screws	1¼″ No. 14	2
13	Flat Head Wood Screws.	⅞″ No. 6	16
14	Escutcheon Nails	No. 16—1″	24
15	Flat Head Wood Screws.	1¼″ No. 9	4

Seat—The seat is made up of six strips, glued and nailed to battens with escutcheon nails. The battens are notched out to receive seat supports as shown. The seat is pivoted to the legs with two ¼″ diameter tire bolts, as shown on drawing. Screws with heads removed and slotted are to be screwed in battens as shown; these screws or pins are intended to prevent the seat from collapsing while in use; they also act as guides when chair is being folded.

Seat Supports—Seat supports are glued and screwed to

the inner sides of long legs; upper ends of supports fit into battens as shown.

Finish—Chairs if made of birch or maple are to be stained mahogany; if made of ash or oak they are to be stained light, fumed or mission oak, followed with one coat of shellac and one coat of varnish.

QUANTITY PRODUCTION*

W. J. Alexander, Union High School, Courtland, Calif.

"OUR factory is now prepared to produce standardized, quantity products. We are rapidly approaching the peak of production, and our customers may rest assured that we are fully able to take care of all orders."

Such is a sample of our trade journals' advertisements. About the same time a cosmopolitan daily says in its telegraphic columns: "The School at ——— is now prepared to give intensive courses in vocational agriculture to meet the steadily increasing demand for short, intensive working courses for teachers and ranch foremen." A few years ago it was not unusual to see something like the following: "Spanish in ten easy lessons. Intensive work will make you a master of fluent Castilian and a successful, serviceable correspondent in not to exceed six weeks," also "French at a glance," Mathematics overnight, etc. These are not fantastic situations conjured up to support or fortify a fictitious case for the sake of academic discussion. They are properly and legitimately classified under the general topic,—"Quantity Production." The respective phases of activitiy are poles asunder, yet the content of each is a product of the same general status. And this general status is an hysterical condition of the public mind, —the incarnate state calling for machine-efficiency. In a general way, the day and reign of the skilled mechanic, artisan or craftsman has, seemingly, passed forever. In his stead there has come the mechanical "jig." Yes "jigs" of all possible and conceivable kinds,—the millenium of the machine,—the displacement of the intelligent hand, obeying and guided by a creative brain, by mere inert matter, so fashioned and conditioned that it produces automatically what aforetime required the thought of a sentient human. Formerly the operative fashioned raw material into things of beauty and service; today he feeds raw material into a jig, and, lo, there is standardized "quantity production," plus. The intelligent individuality of the workman has been lost, sacrificed to the modern Moloch,—"standardized quantity." A close analysis reveals the further fact that the time element has been almost wholly eliminated. This elimination is, probably, a necessary condition, if the intelligence of the skilled workman must, also, be sacrificed and eliminated. That is,—the elimination of the thinker carries the obvious corollary,—eliminate time. For it may be assumed that a pin made in a minute may be as good as one made in a month; nails at 500 a minute are as good as those of Longfellow's Smithy at 500 per day.

When we go into the domain of teaching, we may, then, also, endeavor to eliminate the thinker,—the intelligent master-workman,—but the results are likely to prove unsatisfactory, perhaps even disastrous. However, much we may desire to hasten the process, the time element in education is a sort of mathematical constant. But just now the "jig" is appearing in our educational practices (system). Some of our educational fanciers seem to think that all that is necessary and needful is to feed in the raw material,—students, pupils, disciples—and at the hither end of the school-factory will be found the standardized, quantity product. No, this is no vain fancy. It is fairly and logically deducible from the quotations above cited.

It is surely astounding, when supposedly responsible public (state) institutions in the coldest of cold blood announce in solemn pomposity, that they are prepared to turn out a quantity product, fully standardized, in sufficient quantity to meet the demands of the present economic system. If that is not the introduction of the "jig" into our schools, we fail to understand what language—signifies, or what other logical inference is admissible. The present factory-system is the death-knell of all real craftsmanship. The "jig" is the mortal enemy of the mechanic. It is the triumph of gross matter, glorying in speed over the slower movements of organized matter.

What can be more deadening, more deterrent to mental growth or real intelligent civic life than the condemnation of individuals to feed "jigs," tho their penalization does send production up to "peak?"

As we see it, our schools are, or should be, stabilizers, socially, economically, politically,—not mere machines for standardized quantity productions. Shops and machines may be necessary to meet the world's present wants, tho their price be high. But what are the arguments for "intensive courses of study" in anything, least of all in agriculture? We used to hear, that "knowledge comes, but wisdom lingers." Now that doctrine could be translated, "both knowledge and wisdom may be attained with a 'jig.'" Once we divided the language fakers who professed to teach French "at a glance." But now the socalled legitimate schools have usurped their functions. The fakers have largely disappeared since their calling has been taken over by our schools, colleges, universities. And these last are saying unto the taxpayer: "Come, see our standardized quantity product, all turned out by our educational 'jigs.'"

*See editorial, page 323.

An Experiment in Productive School Shopwork

Harlie Garver, Director Manual Arts, Hastings High School,
Hastings, Nebraska

IN school shop discussions of the last few years the productive project has probably come up for as much comment as any other topic relating to shop policy. Much has been said and done toward establishing productive work as an institution in the school shops of this country, and it is with the purpose of adding just a bit to the already conclusive evidence that this article is written. It is the purpose of the article, then, to attempt an answer to the following two questions:

First, is the productive project justified from an educational standpoint?

Second, can a school shop be run on a productive basis so as to be made to pay financially? Otherwise, of course, it fails to be really productive.

As to the first, it is at once agreed that aside from the actual information imparted, the biggest things to be gained from any shop work are, method, accuracy, orderliness, and a sense of the value of time. If therefore, the experiences herewith presented seem to the reader to further these aims, then productive shopwork is justified from an educational standpoint. The second question can be answered in terms of the figures herewith presented.

To give an intelligent idea of the development of this experiment in Hastings will require a few words of retrospection. Two years ago when the writer came to Hastings as teacher of woodworking and mechanical drawing the shop was inadequately equipped for productive work of any sort. A universal saw and jointer, with two lathes, constituted the power equipment, while the tools could have been duplicated for a few hundred dollars.

An attempt or two had been made at productive work, but these were not a brilliant success. Accordingly, it was with the idea of making good in the eyes of the students, officials, and patrons, and establishing the department once and for all as a vital factor in the educational scheme of the community, that the wood working shop of the high school has turned out during the year several hundred dollars' worth of school furniture. Among these was a filing case for the superintendent's office, estimated by the members of the board to be valued at over a hundred dollars.

At the end of the year bonds were voted for a new junior high school. The building cost $200,000, and this fact furnished the reason for our experiment. Accordingly the board of education was approached with this proposition, that if the workworking department were supplied with machinery and power sufficient to make it modern, the department would agree to build all the school furniture for the proposed school, thus saving the cost of the equipment. After some convincing arguments were given, in the light of what the shop had accomplished during the year, the machinery was installed, the chief item being a 24" surfacer, hollow chisel mortiser, band saw, bench jointer, oilstone grinder, and ten horsepower motor.

Plans were made for building the equipment according to agreement, and work actually began at the beginning of the second semester, 1917-1918. Construction was well under way by the close of the school year, and since it was intended to open the new school in the fall, arrangements were made to carry the work of the department thru the summer in order to insure full equipment for the school.

The teacher problem was already solved, as the instructor in charge was hired for the year, another was to begin work in July, and a third, then teaching chemistry but originally a shop teacher, was available a part of the summer. In this way there were two teachers on hand most of the time.

So the matter was announced, and six boys hired; not the best six we had, because most of the older boys were in khaki or were too high priced, but boys of varying degrees of experience and ability. Of the six who started the work, two had had three years of shopwork, one had two years, and three one year only. The wages averaged about thirty cents an hour, good wages considering the experience. The reason we paid as much was that we had to compete with local firms in hiring the boys. Workmen were scarce.

This work was carried on during the summer ten hours per day, and during the school year as class work, the undertaking being practically complete as this article is being written, in March, 1919.

During all the time that this work has been carried on it has been kept in mind that this is a school shop, not a manufacturing institution. Accordingly it was the aim not to put the boy to work with orders simply to do a thing, but to see that he understood what he was doing, what relation his job had to the completed project, and why that method was used.

Factory methods in quantity production were used whenever possible, and the boys made their own jigs whenever practicable. The work of the instructor in charge consisted chiefly in draughting details of the work, getting out shop tickets for use in getting out material, keeping up the equipment, and supervising the work. The other teachers employed worked on the projects, of course, but not full time, one working two months and the other about half the summer.

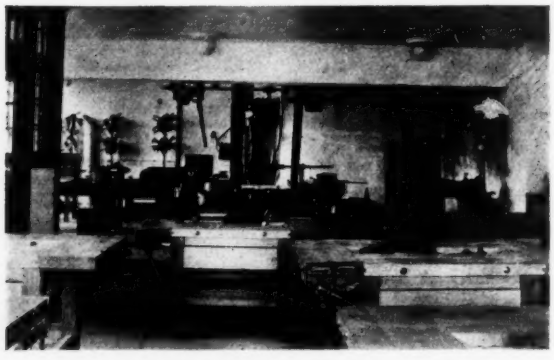
So the work was student work. It could not even be considered a case of apprentices and journeymen, as the former outnumbered the latter three to one. We employed teachers because we had them, and certain

CAFETERIA AND KITCHEN EQUIPMENT MADE BY STUDENTS OF THE MANUAL ARTS DEPARTMENT, HASTINGS, NEB.

pieces were put together a little better than if the boys had done the work, but the extra teachers were not necessary to the carrying on of the work.

The last report of the work completed made to the board of education follows in part, and covers a year and one-half.

Project	Value
3 draughting room cases, 72 drawers, 72 board spaces	$ 225.00
4 double principals' desks	120.00
21 double work benches	472.00
9 agriculture work tables	108.00
1 agriculture demonstration table	30.00
Racks for agriculture supply room	60.00
Finishing room equipment (cupboard, table)	45.00
Supply table, white enamel, acidproof top, sliding doors	125.00
3 sewing tables, 14 drawers, each 39" by 9', basswood	240.00
1 science lecture table (2½' by 12')	250.00
Pastry table, 3' by 8', birch top, sliding doors	100.00
Vegetable table, 3' by 8', (zinc top, sliding doors)	100.00
Work table, 3' by 12' (birch top, sliding doors)	125.00
20 dining room tables (solid oak)	200.00
12 double and single tables and sinks (white enamel, acidproof tops)	520.00
31 teachers' desks (solid oak)	620.00
3 drawing tables (seating 42 pupils, Art dept.)	200.00
Toolroom cupboard, motor stand and cupboard, other wood shop equipment	115.00
1 screw, nail, blueprint and supply case (55 drawers)	100.00
10 music stands	30.00
2 shower benches	24.00
175 sewing lockers, master keyed locks	962.50
1 chemistry table	300.00
1 score board for gymnasium	10.00
Extra cafeteria equipment	22.50
Miscellaneous items too numerous to include here.	947.20
Freight, drayage, setting up, etc., if bought elsewhere	325.00
TOTAL VALUE	6,376.70
Total labor	1,387.41
Supplies, lumber, stains, hardware, etc.	2,685.16
Total cost	4,072.57
Gross saving	2,304.13
Depreciation on $2,800 of permanent equipment, 10%, 1½ years	420.00
Net gain for the department	1,884.13



WOODWORKING BENCHES MADE BY STUDENTS.

A word of explanation may help the reader to get an idea of the fairness of the estimate. Values were based on catalog prices of similar articles, quoted by manufacturers, or estimates made on basis of materials, labor and overhead. The value of each item was carefully estimated, and compares with those values placed upon the goods by school equipment salesmen.

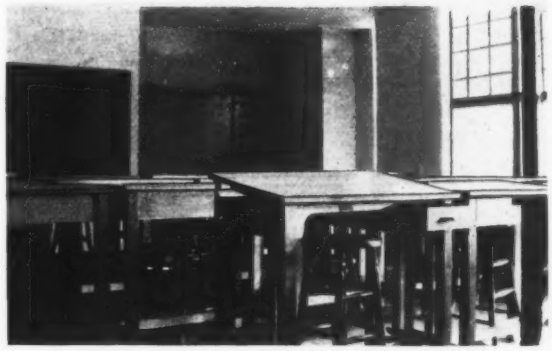
As to a basis for quality the writer does not wish to claim too much, but agrees to make a comparison with the work of any other school made under similar circumstances. One of the best things that have been said was by persons who wished to know which work the local planing mill (which furnished all millwork for the school proper) had done, and which we had done. Furthermore, the work has been inspected by several school equipment salesmen and pronounced equal to school equipment sold by their firms, discounting occasionally for such things as dovetailed construction, which we were not equipped to do, and the like.

Let it be understood also as to salaries of the teachers and wages of the students. Inasmuch as the teachers must be hired anyway, their salaries were included only when school was not in session during the summer months. The wages paid the students, of course, was for vacation work. But it will be readily seen, that if it were put to a test case, the saving to the district would pay the teacher, since he has taught

actual shopwork only one-half of his time, and still leave a very good wage for the students. But of course it is not an object of this work to make the district any money. Taken altogether the district is not ahead greatly by the experiment, but these things have been accomplished:

First, we have demonstrated to the officials of the school and the always doubtful public that we are doing practical work in a business-like way, in competition with manufacturing institutions.

Second, the good done the student is incalculable when compared to the desultory work often done on individual projects in which the chief idea seems to be to pass away the time. The boys have learned to be business-like. They made out time cards indicating the project in hand and the nature of the work done, and so have learned the value of time. They did things as tradesmen would do them, with the added advantage of having a boss who had so much interest in developing the boy as in completing the project.



DRAFTING ROOM EQUIPPED BY STUDENTS.

In a word, productive work has been given such an impetus that the community is beginning to look for the same kind of an idea carried out in all phases of school industrial activities. From now on school shopwork must be made intensely practical to satisfy pupils and patrons who have found out that "it can be done."

Educational Preparation of Working Boys and Girls

Frederick E. Shapleigh, Secretary, Public Education Association, Buffalo, N. Y.

DURING its first year more than 1,100 boys and girls have registered with the Juvenile Department of the New York State Employment Bureau, in the City of Buffalo.

The supervisor of the juvenile department,[1] from a study of its records and from personal contact with the applicants for work, has found among these boys and girls a surprising and lamentable lack of training either of intellect or of hand, which would fit them to become capable and intelligent citizens.

At the request of the supervisor, the Public Education Association has compiled the following facts, suggestive of the scope and character of the problem involved. These statistics were compiled before the signing of the armistice and the subsequent shifting of labor demands.

Of the 1,186 cases investigated, 841, or 70.5 per cent were boys. Ages of all children registered ranged from 14 to 18 years, with the exception of fourteen children who were either below the legal age of 14 years or did not know their age.

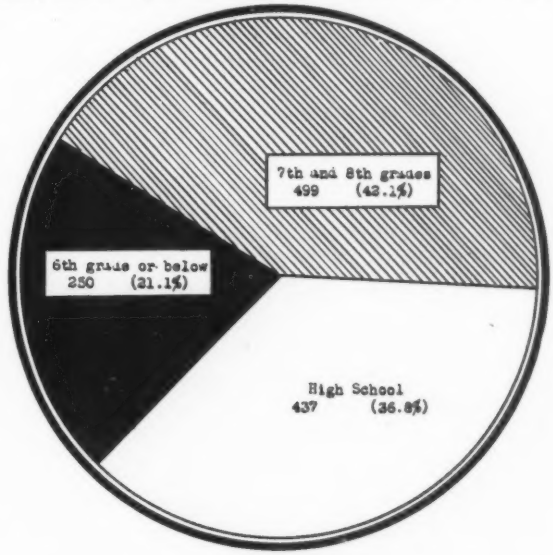
The extent to which these working boys and girls have profited by the schools is indicated by Graph 1. Sixty-three per cent have not had even one year beyond the eighth grade. Twenty-one per cent have not gone beyond the sixth grade. It is in this lowest group that the largest problem is found.

Graph 2 shows the grades attended or completed by these boys and girls. The majority have had schooling ranging from the sixth grade to the first year of high school, inclusive.

Approximately 93 per cent of the 1,186 working boys and girls have received no occupational education. Four per cent have had business training and three per cent have had vocational training.

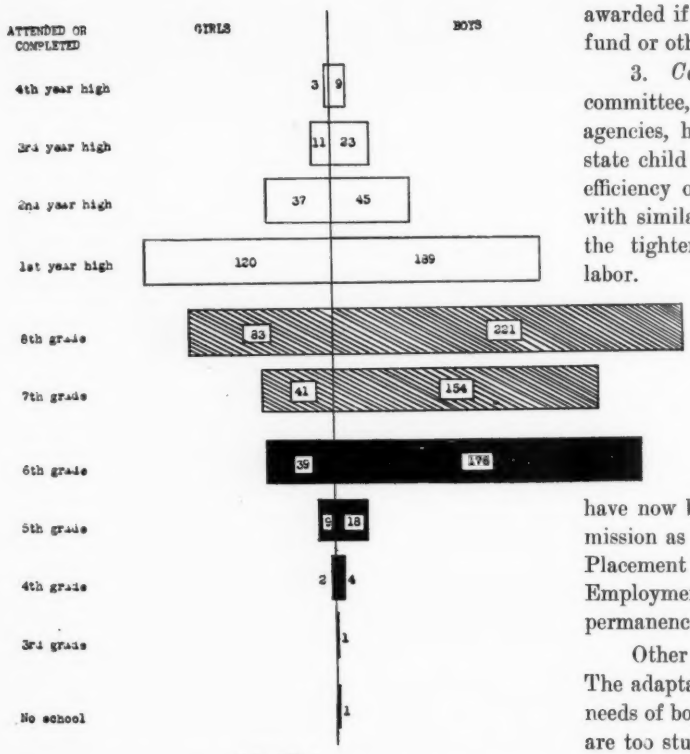
Of the seven per cent receiving occupational training, 37 are boys and 50 are girls. Eleven of these boys graduated from vocational school; 26 attended vocational school but did not graduate. Of the 50 girls, 42 are graduates of business schools, and eight attended but did not graduate.

In studying the nationality of the 250 children who left school at the sixth grade or below, it was found that 222, or 88.8 per cent, were American-born. Of the



GRAPH 1.
Educational Preparation of 1186 working boys and girls between the ages of 14 and 18 years.

[1] Mrs. Elizabeth R. Hanley.



GRAPH 2.
Educational Preparation, by Grade in School, of 1186 Working Boys and Girls between the ages of 14 and 18.

American born, 22.9 per cent had parents of American ancestry; 45.9 per cent had parents of Polish ancestry; and the remainder were chiefly of German or Italian ancestry. Of the 28 children born abroad, 39.3 per cent were Poles and 35.7 per cent were Italians.

These facts, compiled coincident with the closing of the war, and the breaking down of the abnormal demand for labor of any type or quality, were presented to a group of employment managers, social workers and educators.

The problem confronting the group was this: What shall be done with the applicants averaging 50 a day, at the Juvenile Employment Department, made up of boys and girls of the type depicted in the above statistics?

After several conferences the following committees were appointed, with duties as stated:

1. *Committee on back-to-school movement.* This committee, working thru volunteers, and affiliated with the local Federal Children's Year Committee, visits the homes of boys and girls who are seeking employment, studies the case and urges wherever possible a return to school.

2. *Committee on Scholarships.* This committee has for its purpose the securing of scholarships for boys or girls who otherwise would be forced to become or to continue wage earners, to their own detriment. Each case which arises is investigated and no scholarship is awarded if aid can be secured thru the mothers' pension fund or other public source.

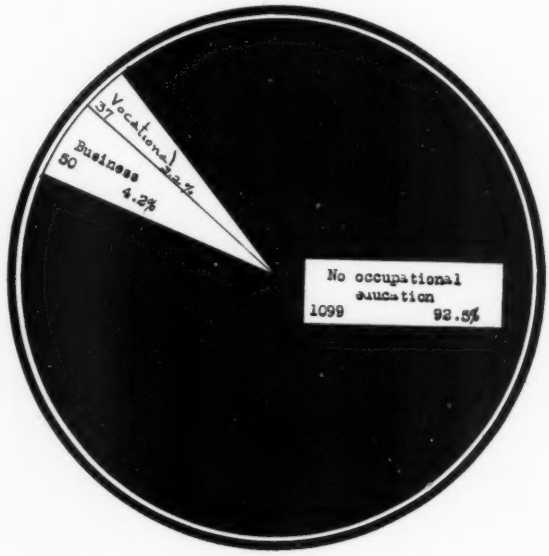
3. *Committee on Legislation.* The legislative committee, in conference with various local welfare agencies, has formulated proposed amendments to the state child labor laws which would tend to increase the efficiency of the present laws, and is now cooperating with similar movements in other cities of the state for the tightening of the regulations surrounding child labor.

4. *Committee on Publicity.* This committee is preparing literature and distributing it among parents and children, presenting the advantages accruing by continuance in school.

The group of men and women out of which these committees have arisen have now been appointed by the State Industrial Commission as an Advisory Committee to the local Juvenile Placement Bureau, or Juvenile Department of the State Employment Bureau. Given this official standing, the permanence of the work is assured.

Other problems already under consideration are: The adaptation of the school system to meet the specific needs of boys and girls who altho unclassed as subnormal are too stupid, or uninterested, to continue in the ordinary grade work; the educational possibilites of neighborhood or social centers, as a means of stimulating youthful development.

The problem ultimately resolves itself into a question of school efficiency. For if the school system were sufficiently flexible to adjust itself to the special needs of the industrial-minded, able to guide youthful enthusiasm and to point the way convincingly to more extensive training and correspondingly larger returns of money and satisfaction, these boys and girls in many



GRAPH 2.
Occupational Education received by 1186 working boys and girls between the ages of 14 and 18 years.

instances would have been saved from the uncertainty of employment and mediocrity of attainment now their lot.

With a city-wide intermediate school plan soon to be put in operation, and with other changes in the schools now contemplated, the problems at present confronting juvenile employment managers and placement bureaus will undoubtedly grow less—but only at the price of eternal vigilance against the allurements of the "pay envelope."

MONOPRINTS

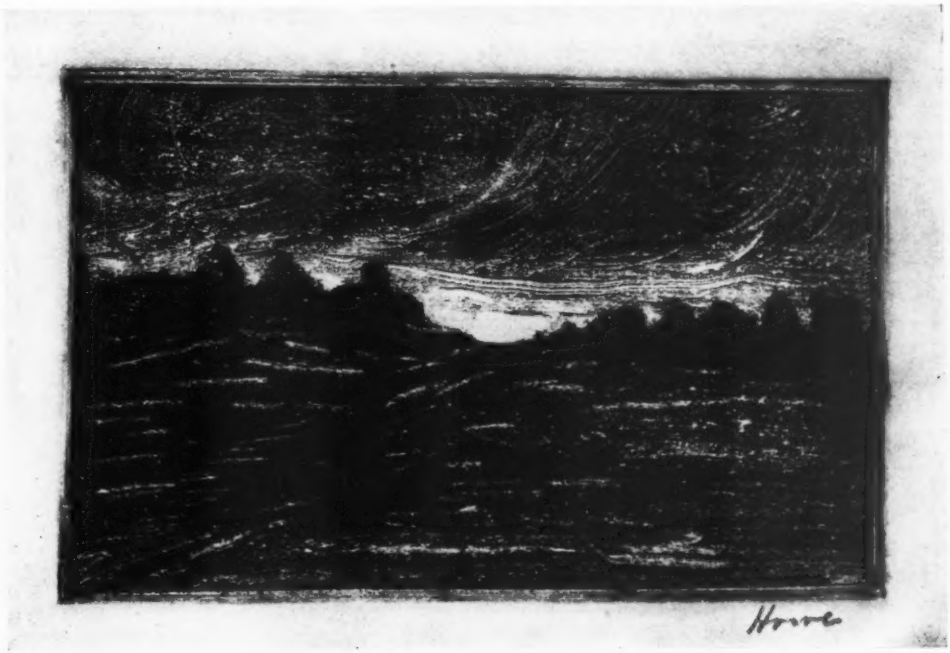
Esther Brock, New York City

HOW a thing is actually done holds a perpetual interest for many. The procedure, the gradual development, step by step, carries with it as much charm often, as the finished product. The history of printing, that is, of transferring a design onto a certain surface, would in general come pretty near being the history of civilization. Countless ages ago lines were carved into stone to tell a story. Later, lines and forms were drawn on sheep skins and traced on pottery, to explain or expound, perhaps to propitiate some god. For fear, they tell us, prompted the beginnings of art. Messages must be sent and so signs, letters, and figures were evolved. But the fun of telling a story by means of lines, forms and colors is not only as fascinating, but as necessary today, as it was in the stone age.

Vast machinery has grown up to expedite reproduction, but the "hand-made" article is of even greater value today because of this machinery.

An etching, a lithograph, or a wood-block print, while in a way employing mechanical devices, reflects the personality of the artist in the very manner in which these devices are handled. "Hand printing" offers no end of diversion and variation.

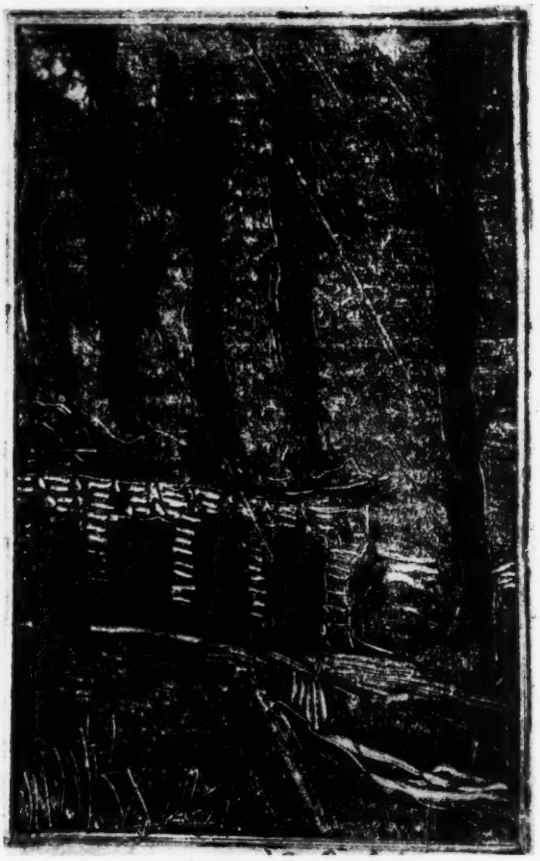
A "Monoprint," as we call these accompanying pictures, is simply the little reproduction of a picture painted on a hard surface, copper, tin, or glass. Only one print may be "pulled." But as it is quickly made this is not a drawback, but rather enhances the value of the print if it is good.



NEAR CANTIGNY.
A Monoprint by Lester E. Howe.
This young man, who had been a trapper and cowboy, served ten months in France.
He lost a leg as the result of a dum-dum rifle wound on the Marne.

To make an etching or a wood-block print the drawing has to be "engraved" into the plate either by acid or with tools. This is often a difficult and tedious task, especially for a convalescent soldier or a restless child. On the other hand the speed with which results may be obtained in "monoprinting" does not in any way prevent the finished print from being artistic in the extreme. In other words, the technic is so simple as to be almost "fool proof."

The accompanying prints were made by wounded soldiers at the Walter Reed Army Hospital, in Washington, D. C. In no instance was the soldier an artist,



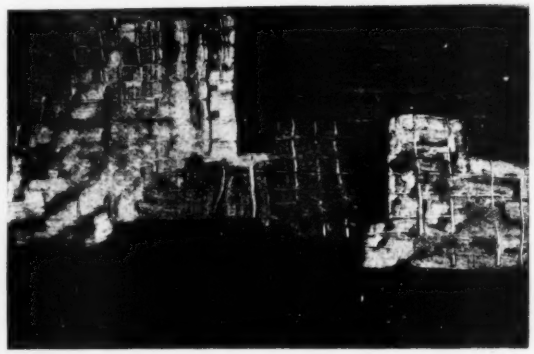
A DUGOUT IN THE RAIN.
By Wm. C. Atkins, Connecticut.
This private, who was cited for bravery, was wounded four times, lost left arm and several fingers of right hand, gassed, burned with liquid fire, etc.

or had he had any training that way at all. The men simply practised a while, using perhaps pictures or photographs for samples, and then began on their memories of "over there."

The process is very simple and requires few tools. We had a few pieces of galvanized tin which were cut out and given me by the tinners working near the ward. It may be obtained at any tinner's.

The surface is wiped clean and a middle tone of

A "REST CAMP" IN FRANCE.
By Lester E. Howe.



NEAR THE MARNE.
By Lester Howe.
A memory picture of the place where Howe lay when wounded.

raw rubber umber oil paint is stroked on. It must always be remembered that the print is just reversed from the picture on the tin. Therefore, if a word is to appear on it, the lettering must be made backwards. A flat bristle brush is best for the background, but a dab of cotton may also be used. No turpentine or medium of any kind is used. Now the lights may be wiped out, with perhaps a bit of rag. For instance, if the sky is lighter than the ground it may be wiped off with a slight movement, perhaps to represent clouds or a streaked effect. The sky should be a little lighter near the horizon. Moonlight effects may be easily produced by leaving a smooth tone, and wiping out the moon

A REST BILLET.
Mabson was gassed at Verdun.

THE CASTLE OF ANGERS AT MAINE-ET-LOIRE.
By Sgt. W. H. Justice.

more cleanly. With a brush the foreground may be made to represent grass or rough earth. This is, a change in the direction of the stroke and a slight change in value might represent a road or a stream, which usually appear lighter in a picture. The darks, such as trees, houses, figures, etc., are painted over the middle tone with an ordinary red sable or camels' hair brush. Care should be taken not to get the paint on too thick. Experience will soon teach just how much paint to use. To accent the scene, or bring out some important detail, a pencil may be used. Go over the edges of perhaps the nearest object. Clean brilliant high-lights are best, wiped out with a pencil eraser.

One should think in terms of values only and not of "line," that is, the trees should be darker than the background or they cannot be seen, and so on. Rich darks (not thick and sticky) and a few brilliant high-lights give the best effects. Care should be taken not to work on the plate longer than thirty minutes as the first tones may dry and not print. Just before printing the plate is picked up and the edges wiped off with a rag, the fingernail being used as a gauge, to give a neat margin all around.

The plate is now placed straight on a clean piece of blotter; an ordinary piece of drawing paper, or heavy Japanese paper may be sponged off on both sides or dipped in water. Care should be taken not to let drops of water fall on the plate. A fair margin on the paper must be allowed—then this wet paper is placed over the plate so that the plate is well spaced. Another piece of blotter is put over it and pressed down firmly and evenly—not so the paper will slip on the plate. The back of a tablespoon can be used very successfully to do the pressing with—being sure that every part is given an equal rubbing and pressure.

After the print is lifted up all the mistakes are apparent and may be avoided on future trials. The plate must be wiped off clean immediately. Of course, a number of colors may be used, and glass may be substituted for zinc or tin. For the beginner one color is enough to grapple with and for schoolroom practice is highly desirable.

After a trial or two the possibilities of this sort of reproduction assert themselves and little "tricks" of technique are discovered which add charm and give all sorts of effects to the general composition. However, it is needless to add, that simplicity and sincerity are the fundamental qualities which make for success.

FRENCH FURNITURE

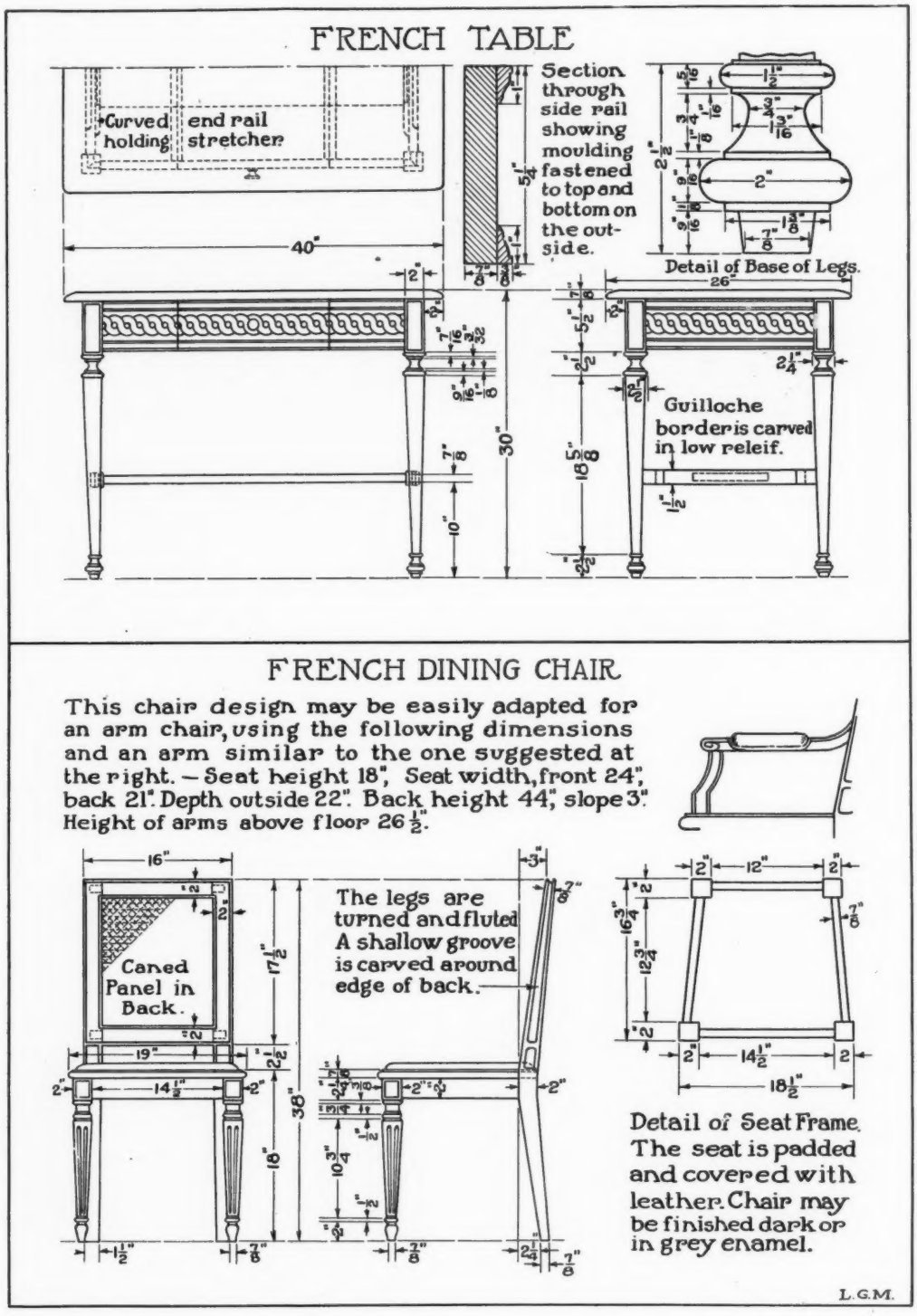
Leslie G. Martin, W. Henrietta, N. Y.

THE reign of Louis 14th, 1643 to 1715, was the longest of any of the French kings and in many ways the most important. It was the fashion at that time to admire the arts and there was great activity among the artists and craftsmen in the different art branches. Interiors at that time were of a very elaborate type and things were done on a lavish scale. This style needs considerable adaption for modern use.

The furniture of the period was very elaborate. Its structure was rectangular, altho some of its beauty was lost thru over-ornamentation. Curves of a simple type were used occasionally. The furniture was upholstered with silks, brocades and tapestries and velvet coverings

were also used on chairs and tables. The following colors were used quite extensively: dark reds, blues, greens and gold. The textile designs were usually simple. Chair legs were erect giving a sense of support. The furniture was ornamented in many ways. Series of small pendant bell flowers growing smaller as they go down, were used on chair and table legs. Cabinets had conical feet carved with spiral fluting.

The king employed several craftsmen to execute masterpieces for him. One of the greatest of these was Andre-Charles Boulle. Many pieces of his furniture have not been equalled. He also trained other crafts-


FRENCH TABLE
Curved end rail holding stretcher
Section through side rail showing moulding fastened to top and bottom on the outside.
Detail of Base of Legs.
40"
26"
30"
Guilloche border is carved in low relief.
FRENCH DINING CHAIR
This chair design may be easily adapted for an arm chair, using the following dimensions and an arm similar to the one suggested at the right. — Seat height 18", Seat width, front 24", back 21". Depth outside 22". Back height 44", slope 3". Height of arms above floor 26 1/2".
Caned Panel in Back.
The legs are turned and fluted A shallow groove is carved around edge of back.
Detail of Seat Frame. The seat is padded and covered with leather. Chair may be finished dark or in grey enamel.
L.G.M.

men. He used rare woods and was the originator of furniture which was inlaid with metals such as copper and tin. Shell was also used. His method was to fasten inlaying before this time but there was none that compared with his work. The mounts used were of brass or ormolu, exquisitely molded and chased, and very

3. ARM CHAIR-LOUIS 15TH PERIOD. CARVED VERY ELABORATELY WITH LEAF AND FLOWER FORMS. LEGS ARE OF THE CABRIOLE TYPE. THE CURVED OUTLINES AND SURFACES ARE A CHARACTERISTIC FEATURE OF THIS PERIOD. THE CHAIR IS UPHOLSTERED WITH A FLORAL PATTERNED SILK. FINISHED IN GOLD. LATER DESIGNS BECAME MORE CLASSIC.

1. SIDE CHAIR-LOUIS 16TH PERIOD. STRAIGHT TURNED LEGS, CARVED WITH FLUTING. CIRCULAR SEAT FRAME WITH CARVED BEADING AND ROSETTES. CURVED BACK WITH CARVED ACANTHUS LEAVES AT TOP. LIGHT FINISH. SILK SEAT COVERING.

2. ARM CHAIR-LOUIS 16TH PERIOD. CARVED WITH BEADING AND ACANTHUS LEAVES. SMALL URN ON BACK. GOLD FINISH TAPERING FLUTED LEGS.

4. ARM CHAIR LOUIS 16TH PERIOD-FRENCH 18TH CENTURY. STRAIGHT TURNED LEGS, CARVED WITH STOPPED FLUTING AND CARVED ROSETTE. THE ARMS AND BACK HAVE A ROW OF PEARL BEADING AROUND EDGE. SILK EMBROIDERED UPHOLSTERY.

5. MODERN FRENCH CHAIR ADAPTED FROM FRENCH STYLES-FINE EXAMPLE. CARVED MAHOGANY LEGS AND ARMS. SILK UPHOLSTERY.

LOUIS 14TH 1643-1715
LOUIS 15TH 1715-1774
LOUIS 16TH 1774-1793

FRENCH FURNITURE

different kinds of wood or metal together; then saw out a pattern and substitute pieces of the different kinds of wood or metals for panels. Metal had been used for beautiful designs were often inlaid. Shell mountings were also used. The human head and lions' paws were also used as designs for mounts as well as designs pat-

terned after military trophies. His furniture was very graceful yet usually of a simple construction. His marquetry work was very skilfully executed.

The chairs of this period were rather stiff and dignified but later curves were used and a very beautiful style developed. The classical architectural motifs used in interiors were the astragal, dentil, egg-and-dart and shell. The woodwork was usually painted and gilded.

The transition period between Louis 14th and Louis 15th was known as the Regency. The lavish way of doing things ran to excess for a few years but later developed a better manner of living. The furniture was reduced in scale and was not so gorgeous. The structure became lighter and more refined. The Flemish curve and cabriole leg became more popular and were used considerably on chairs and cabinets. In harmony with the curves the Racoco, or shell, motif was used for ornamentation in several different materials. The textiles used were lighter in value altho many colors were used.

The reign of Louis 15th, from 1715 to 1774, marked the high point of the decorative French styles. While it had many disadvantages, it also developed a style more refined in line, form and color. It is considered the most beautiful of the French styles. The interiors were more simple and architectural elements were omitted. Curves on the outlines of the furniture, as well as curved surfaces, were a characteristic feature of Louis 15th work. The furniture was more graceful and refined, and more materials were used in its construction. Natural walnut, beautifully carved and formed, was used considerably. The decorative shell motif was used until it became a structural element. The supports were out of proportion on some pieces and bent so that the sense of support was lost. Naturalistic motifs as flowers, cupids, and conventionalized shell motifs, heads in brass, bronze and applique garlands and wreaths were also used as decorative motifs.

The chairs were often carved with female faces and figures, some of which were very beautiful. The cabriole leg as well as curved arms were used, and irregular outlines formed the backs. Panels with curved corners were also used. They were finished in many ways, some were gilded, others painted in light tones of gray, green, blue and cream, and sometimes the high points of the carving were touched up with gold. Tapestry, silk and brocades were used for upholstery.

The table legs were usually curved and decorated with carvings of the female head and bust, or with flowers and leaves at the top, and were sometimes formed like a hoof at the base.

Ormolu mounts of an elaborate design were still used. In the latter part of the period the furniture was over elaborated. Panels painted with landscapes and floral designs were used to some extent.

This period contributed much towards design but needs considerable adaption before it can be turned to modern use.

In the reign of Louis 16th, from 1774 to 1793, the ideals of the preceding periods were dropped and many changes took place. The decoration became more classic and simple, and the people returned to a simpler mode of living. Much of the wall decoration was eliminated.

Furniture again became more rectangular in form and the cabriole leg disappeared, and the furniture was made in natural wood, enamel and color. The furniture ornaments were classic and well proportioned. Cherubs, bows and arrows and flower garlands were used quite extensively.

Chair and table legs were square and tapering or turned. They were straight and vertical and of a lighter form. Acanthus leaves were used as a carved decoration in all the French periods, with slight variations in each period. Other ornaments used were metals, wreaths, rosettes and shields. Marquetry was used some as was the ormolu mounts of the preceding periods. Marble was used some for table and cabinet tops. While the curve was dropped and the straight line substituted in the furniture of this period and the styles went to the opposite extreme from the preceding periods, the furniture showed greater refinement. The construction was decorated. Veneering was also used for ornamentation in various patterns and colors. Much vulgar carving was eliminated and the furniture was more sensibly constructed. The transition from one period to another took place slowly and there are many pieces which have characteristics of the two periods. Many changes for the better were made in the field of decoration during this period. The relation of the different parts of an interior to each other became better understood.

For the privilege of photographing the chairs shown, I am indebted to the courtesy of the Pennsylvania Museum and School of Industrial Art, of Philadelphia for figures 1, 2, 3, and 4, and to the Mechanics Institute of Rochester, N. Y., for figure 5.

THE time has come to reorganize courses in "drawing." It is true that drawing may have educational, industrial and social value but we know that it does not always so work out. We know, for example, that picture-making continues to be held up as the chief aim and purpose of drawing. We find that "handwork" is given at one school period and "drawing" at another. We discover courses in design given entirely apart from any construction. We see children forced to draw when they can only appreciate, and we would gather from certain courses in drawing that one can only appreciate a well-arranged dining room when he can draw in perspective the room and its furniture.

—Arthur D. Dean.

THE NEED AND VALUE OF SHEET METAL WORK IN THE HIGH SCHOOL

W. H. Snyder, Jr., Instructor in the Lakewood High School, Lakewood, O.

(Conclusion)

A Sheet Metal Shop.

The accompanying drawing shows the writer's sheet metal shop in the Altoona high school and is suggestive for the layout of a shop in an average high school. The shop illustrated measures 44 x 36 feet, and is ample in size and equipment to accommodate classes of 24 to 28 students.

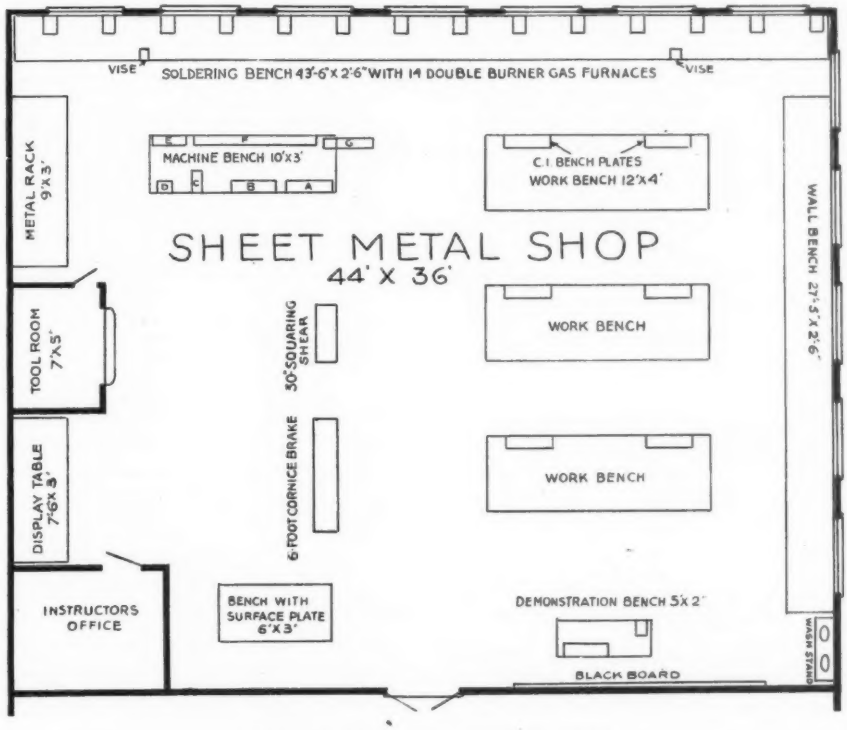
The soldering bench, on which are located the gas furnaces for heating the coppers is the bench at which most of the soldering should be done; while it is not absolutely necessary to have a separate bench for this, it avoids having acid and other of the soldering fluxes smeared over the other benches, which are used for making and working up the shop layouts. At this bench the student is free from any jarring of movement of other students that might interfere with him. The bench should be about 34 inches high, 30 inches wide. The top is made of 1½ inch stock, which can be covered with metal if desired. By using 16 gauge steel as a covering you will avoid having the wood burnt and charred by the heat from the furnaces and soldering coppers.

The wall bench which is used mostly for drawing and making shop layouts is 30″ wide, and 30″ to 34″ high; the outer edge should be of 2″x12″ planking and the remainder can be of one inch materials. When making up work on this bench, the outer edge or side is the one mostly used that is why we make it of heavier stock.

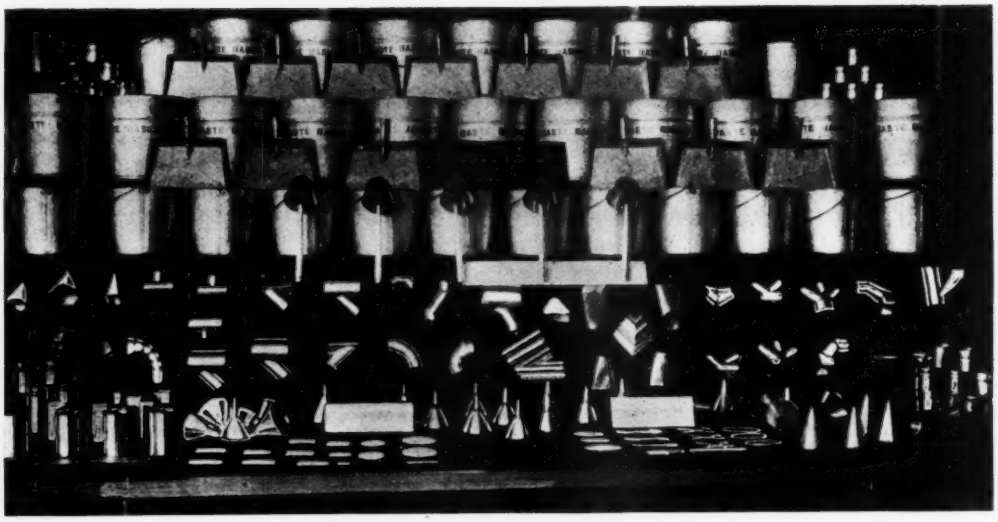
The three work benches 12′ x 4′ are 30″ to 34″ high and are made this size so that students can work on both sides of them. Six students can work very nicely at each of these benches. The outer edges should be made of 3 inch maple or some other hard wood not less than 12 inches in width and the center can be filled in with 1 inch stock. The cast iron bench plates, which are used for holding the different stakes, and mandrels are inserted into the maple planks, so that they are flush with the top and even with the edge of the bench; these benches should have a shelf underneath about 6 inches from the floor. This provides a place for the student to put his tool pan, and to lay a piece of metal or a stake that he does not wish to use immediately. These benches should be not less than four feet apart and farther if it is possible to arrange them so.

The 5′ x 2′ demonstration bench is used by the instructor in making demonstration, and is fitted with a bench plate, and a gas furnace. It may have either a shelf or a cupboard underneath. The cupboard is the best if the instructor has any number of models that he uses in demonstrating.

The machine bench is 32″ high and has a top made of 1½ or 2 inch stock; on the top of this bench are located the stationary and portable machines, as fol-



FLOOR PLAN OF THE AUTHOR'S SHOP.



ARTICLES MADE IN THE AUTHOR'S CLASSES.

lows: A is the location of the forming rolls; B, the folding machine; C, Lever punch; D, double seaming machine; E, Ring and Circle shears; F, space for the portable machines which are taken from one bench to the other, such as the Burring, Turning, and Wiring Machines; G, is the grooving machine; this bench has a shelf or sack underneath about six inches from the floor on which are kept the stakes and mandrels.

The bench with the top as a surface plate is 34" high, the top can be made of cast iron, or of some good hard wood. A cast iron surface plate is very useful at many times and is preferred to that of wood.

The metal rack should be about five feet high and have not less than six or eight shelves for different gauges and kinds of stock.

The tool room is about eight feet high, closed up to four feet from the floor, and the remainder glass, or wire netting.

The display table is a place where finished work can be kept on display so that patrons visiting the school can see at all times the nature of the work the students are doing, the bottom part of this table can be a cupboard partitioned off in such a manner as to form a place for keeping the work of each class from one day to another or until it is finished.

The instructor's office should be entirely closed from the shop partly with wood, and the rest with glass, so that he can keep his records and reports clean and in a businesslike way.

The shop just described contains the following machinery:

Floor.

1 Cornice brake No. 1000*	$109.25
1 Squaring shear No. 0159	76.60

Bench.

1 Burring Machine No. 579	20.80
1 Burring Machine No. 580	21.35
1 Setting Down Machine No. 561*	21.05
1 Grooving Machine No. 518 or smaller	50.00
1 Wiring Machine No. 526	24.25
1 Beading Machine No. 620	29.50
1 Crimping Machine No. 585*	21.05
1 Moores Double Seaming Machine No. 644	42.10
1 Ring & Circular Shear No. 298*	55.80
1 Gutter Beader No. 710—½" Rod	7.40
1 Pr. Forming Rolls No. 382	35.55
1 Bar Folder No. 63	57.90

Note—The articles marked with asterisks are not needed at first, but should be purchased from year to year and thus reduce the initial cost of equipping the shop.

As a clue to the actual work performed in the writer's class during the school year 1917-18, the following list is appended:

5 ticket boxes of 1x tin plate for lunch room	$ 1.85	$ 8.00
24 Bosh dippers for Forge shop	.97	4.80
Renewing handle on a dust pan	.05	.20
Renewing bottom on one bucket	.25	.50
Repairing wash boiler for Domestic Science Department	.10	.20
Renewing Bottom on one wash boiler for Science Department	.36	1.00
One sandwich box for kitchen 16"x12"x6"	1.35	3.00
15 partitions for moulding benches No. 24 galvanized iron	8.30	25.00
10 varnish cans for cabinet shops	2.20	7.50
2 standard size No. 2 wash boilers of No. 24 galvanized iron for ashes	2.85	6.00
Repairs to 24 Oil cans for machine shop	.92	2.00
6 galv. iron pans for biology classroom	.70	2.00
14 galv. iron pans for science classroom 8"x8"x1¼"	1.35	3.00
Repairs to one oil cup for engine room	.10	.50
Covering core bench in foundry with galv. iron	2.16	5.40
Making 24 angles 3"x3"x1"x$\frac{1}{16}$" for repairing chairs	.40	.80
Making head piece and shield for Liberty Loan Committee	.60	donated
2 doz. galv. iron wash cans for stock room	15.30	32.00
2 doz. scrub buckets for stock room	16.00	24.00
6 varnish cans for woodworking shops	1.50	4.50
Polishing nickel plated fixtures for school piano	.45	.75
12 Ticket boxes for lunch room	3.35	16.00
Making spout for bellows in foundry	.14	.50
Repairing boiler for domestic science dept.	.05	.20
Making 4"—90° Elbow and slip collar for furnace blast pipe	.42	1.00
Making 60 pint, and 30 quart measures for grade schools	8.25	30.00
Renewing bottom in scrub bucket	.20	.50
12 standard waste cans for stock room	7.72	16.00
Repairs to lantern for watchman	.10	.50
One sandwich box for lunch room 18"x16"x8"	.52	4.00

One drip pan for machine shop No. 24 galv. iron	1.05	3.00
Covering end of running board	.25	1.00
One galv. iron spout for melting furnace	.10	.75
Repairing 4"—4 way branch for blast pipe	.20	1.00
One large waste paper can for forge shop	1.30	5.00
One doz. standard waste cans—galv. iron	7.65	15.75
One galv. iron box 18"x12"x6" for engine room	.90	2.45
8 scrub buckets for stock room	5.36	8.00
2 mess equipment boxes for U. S. government	12.00	35.00
31 Standard waste cans for stock room—galv. iron	19.84	40 92
	$127.16	$312.72
		127.16
Saved the district		$185.56

Note—At this rate you can see how a school district can pay for its sheet metal equipment in three or four years.

RELATION OF COSTUME DESIGN TO FINE ARTS

Pearl Salter, Director of Household Arts, State Normal University, Normal, Ill.

(Couclusion)

The media for this which will give a broader type of experience, may be modeling or draping with colored paper on actual fabrics even tho it be only cheesecloth. Current fashion magazines are used, and in conjunction with the historic costume books already studied should give the necessary stimulus to the imagination, as well as furnishing many practical and interesting suggestions for the costumes.

It is presupposed the student has some knowledge of technical construction work before attempting modeling and draping. She may or may not have made a tentative representation in pencil of the costume, which she has in mind. The material used is to be of as near the kind in mind for the dress as if it were to be actually made, that is, it should be of about the same body, if of a soft material, cheesecloth can be used for the expression of her idea. Of course if expense is of little account then actual materials of which the costume would be evolved would add still more to the effect. But be the material what it may, such work is of value in that it gives the girls not only a sense of the mastery of materials, but gives them an opportunity to "originate" and carry out an idea for a costume, which has been evolved as the result of the study of historic costume. It also gives them opportunity for demonstrating and applying directly their understanding of such design principles as can be illustrated in their "creation."

Color is another element to be reckoned with and the outline of work varies with the ability of the class, previous work done, etc. I shall only suggest what I consider possibilities in such a course for each media used has its advantages and disadvantages. Presupposing however that terminology of color, hue, value, chroma is understood as well as color harmonies, I would probably first again refer to such historic costume books and prints as have been sources for study of costume and in addition refer to books illustrated by such men as Dulac, Jules Guerin, Maxfield Parrish, etc. These would be valuable examples to use in analyzing color, tho again this is difficult unless the student has worked with pigments and understands the elements of a beautiful color, i. e., if in a beautiful blue she views it not merely as blue but as a mixture of emerald and violet. Perhaps a certain amount of representation work would be valuable and some of their tracings of Elizabethan costume for examples might be worked out in color. Such representation work does show better of course and is gratifying in this respect. The color wheel is another valuable and legitimate aid in analyzing color. Color combinations are more difficult than analysis of color however and a great deal of training is necessary before the student is able to get away from the usual combinations. Fabrics with which to drape or model or even large collections of samples (large) offer an excellent and highly valuable media for expression as the fabrics themselves give a more direct message to the student, I believe, than other media. Texture which is closely allied to color, should also be considered and the collection of material should include as great a variety of surface finishes as possible. Based on such study, color combinations may be evolved with help, and understanding of rich colors will come thru the study, and intelligent use of such illustrative material. The student will perhaps better appreciate the intellectual clarity of Chinese color, of the vibratory arrangements of French impressionist colorists, etc.

And so, "as the ultimate permanence and joy of a piece of work is a measure of its beauty and art," must we not help to bring this lesson into industrial and commercial forces today? And one means of bringing in such appreciation is thru the study of historic costume.

Another means of approach to the study of costume design is the more intensive type of course with emphasis on design rather than representation. The student should be familiar with the principles of design as presented in art classes and with costumes of all periods from early Egyptian to the present day, as outlined in any course in historic costume.

The first part of a course is devoted to training the student in appreciation of good lines and spacing, dark and light, color, etc. Many carefully chosen illustrations are presented which show good design in costume. By discussion and a thoro analysis of the value of these designs as illustrating certain principles, a foundation or background is formed to guide the student in her subsequent choice of designs and to stimulate her imagination when original work is attempted.

Following the study of design, which may be considered as a kind of exercise in training the eye and mind, the student is asked to do "original work" in the

sense of interpreting something into her own idea rather than in the sense of "creating" something entirely new.

For any representation work, where the lay figure may be used as a basis for outline drawing of the figure, an analysis first of the human figure is made. "An artistic conception of the ideal form is a figure seven and one-half or eight heads high (head from just below the crown to the chin being the unit of measurement). The contour of such a form is made up of gently rounding and reversed curves which melt into each other, forming beautiful lines. The slight inward curve at the waist called the Greek curve and found in examples of Greek sculpture is considered the most beautiful line of the body." The lay figure is developed from this study and drawn in both front and three-quarter view, and then from kodak pictures one's own figure is sketched. This outline drawing is a certain type of mechanical drawing involving slight training in accuracy and leads perhaps to keener observations of proportions. With outline of own silhouette, sketches of dresses appropriate to the type of figure showing characteristic lines of present styles are made, and probably later such designs are carried out in the sewing course. This gives an opportunity for the expression of the individuality of the student. In designing the costume other factors must be definitely decided on, such as the purpose of the dress, the kind of material, weave, pattern, etc., as they influence the design of costume greatly. Comparison of the scientific reproduction of a costume with the artistic reproduction is made, the kind of line used in each is discussed and such comparisons are illustrated by reference to paintings, sculpture and illustrations.

For the education of the designer or dressmaker there must be opportunity for continuing the work by designing and draping in materials in order to test the suitability of design and to add to the problem of line and color that of texture, which plays so important a part in the success of the finished product. Feeling for texture and line is developed thru study of textiles, the free use of fabrics and experimentation with them in draping and a thoro study of the best forms in sculpture and paintings.

Color should also be made the subject of a definite study as there are but few people naturally endowed with a fine instinct for color while the majority are guided by vague and uncertain feelings. The sensation of color is universal but "full enjoyment of color as beauty depends on the taste of the observer, the ability to discriminate, judge, and understand the higher forms of achievement in its uses, and this appreciation is the result of training and of the exercise of the faculties involved." After one has become familiar with the properties of color by learning to see them, one should practice grouping of colors by making color schemes. This is the greatest test of one's sense of beauty, whether natural or cultivated. "Art training provides means of expression thru which creative impulse is to act, tho sometimes thru expression artistic impulse is awakened and nurtured." Examples for the study of color design may be found in reproductions of paintings in art publications, in books such as works of Dulac, Baskt, Boutet de Mouvel and Howard Pyle, good modern posters, Japanese prints, figured textiles, rugs, pottery, old embroideries, etc.

Experiments with colored papers and fabrics are valuable. Aesthetic experience comes from physiological response and brings about an emotional attitude due to the power of color to awaken and stimulate. Color arrangements can be illustrated by draping fabrics to illustrate the elements of area juxtoposition, texture, etc. Tracings or sketches of a fashion figure can be carried out in different ways, on showing a color design taken from nature or art, another showing color scheme of one hue with change of value only, a third showing unity thru related lines and still another illustrating variety in complements and unity in chroma. Similar examples may be used to illustrate many other principles of color harmony. Sometimes a gown looks mediocre in one scheme while in another combination it is quite distinguished. Texture can also make or mar a scheme. Cotton and woolen fabrics absorb light and are dull, velvets reflect light and are lustrous, while silks have greater play of light and dark. Often in a combination of colors the subtle qualities of texture modify the whole composition. "Transparencies, like tulle and chiffon are the designers' most precious assets: they restore unity to almost any combination of colors and fabrics; they lend variety and sometimes control elements of area, position and contour."

But the aim of all this knowledge is to be able to express oneself in color by means of clothes. However color as applied to clothes cannot conform to definite rules but is subject to variables. The effect of color on a wearer must be emphasized in choosing material for a gown first in relation to eyes, hair, complexion and figure. The latter point, color in relation to the figure, is well illustrated by Whistler's portrait of the "Brewer's Wife," a short stout model whom he transforms to a tall graceful form, apparently by placing a touch of bright color on the tip of her slipper. An optical illusion does it, the eye was caught by the slipper tip, and as the glance wandered upward to the face, unconsciously the beholder felt that the eye had traveled far and the lady's stature increased with the upward glance.

Accessories also play an important part in a costume. A bit of colorful jewelry will make a good design out of a simple costume. The carrying power of light and dark in lace patterns and the essential element of rhythm in laces and embroideries form a large part of the beauty of costume. Hats, gloves, shoes, etc., are all elements which play their part in adding to or detracting from the attractiveness of a gown. Often the caricaturist in art emphasizes, thru ridicule, certain facts which drive home a truth when language fails. So, in

the classroom, making of decorative drawings or posters of various phases of inappropriate dressing may bring one to a realization of how easily clothes may make caricatures of us.

In such courses as the foregoing, perhaps unusual talent has been discovered in representation and for students with such technical ability the costume design course should be followed by other similar ones to perfect technique in the use of such media as pencil, pen, ink, crayons, water color. For such subsequent training emphasis should be placed on representation, the fashion illustrator should know the constructive side in order that his illustrations will be of practical use to the dressmaker.

There are two methods of dealing with material in representation, the direct and indirect. Drawing contributes in two ways to the indirect. First, where experimental freehand sketches are made for the general appearance and secondly, where working drawings are made for detail which are such effective aids for the dressmaker. Unlimited opportunity is given the designer here for the display of the technical ability not only for the carrying out of design principles but for directly applying them to the concrete thing. Representations can be done in any of the different media mentioned at first, all of which the fashion illustrator should have some knowledge of the pen and ink sketching is most used in modes.

For those preparing for a regular trade course, however, a large part of the practical work is the making of advertisements and posters which call for the use of bright colors and clever costumes. In illustrations the student may make color combinations to show the effect of different colors in juxtaposition and varying proportions and in combination with black and white. Such industrial and commercial designers must have an appreciation of structural elements of art, line, light and shade, and color just as much as the painter of landscapes.

For anyone interested in costume design for the stage, quite a different type and much broader training is necessary, but for actual study of costume in relation to the stage much preliminary work should be encompassed in costume design courses. It would involve much of the work outlined already and in addition the costume would necessarily have to be studied in relation to other costumes, to idea of characters, to background, etc. This involves much artistic ability and gives a world of opportunity for the expression of the beautiful, not only that beauty which charms the eye, but that which appeals to our sense of hearing and our capacity for purity and loftiness of thought. "The true meaning of applied art is realized when one can create, visualize and design and then put into practice this creative effort."

The Washington Irving High School in New York has, in addition to the general and intensive types of costume-design course, a two-year trade course which prepares, in so far as possible, the industrial or commercial worker for fashion illustrating, for advertising and poster work, etc. Miss Newcomb of the Horace Mann School, also in New York, writes me the following in regard to her work: "We divide the work into four terms. Design and color are taken up (design being largely applied to embroidery, braiding, etc.) in the first term. In the second, the figure is studied and dress design in connection with figure structure is the basis for the work. Here the design depends mostly upon the work in the dressmaking departments with some study of historic dress as a source. This (the third term) I am working in the industrial art course and take up costume design from the illustration side only. There are several studios where designs (drawings) are made to furnish the manufacturing trade daily. Several of our girls are in such houses." I believe the above is typical of most of our larger and progressive high schools and colleges and all have come to a realization that art work has a very definite relation to the crafts, be it jewelry or costumes.

At the high school, connected with the Illinois State Normal University, costume-design work is done in the art department. This work precedes and is prerequisite to the advanced dressmaking course in the high school so that the household art department can cooperate quite fully with the art department. Such necessary further subject matter is incorporated then in the following terms when the high school student takes advanced dressmaking. Unfortunately we have as yet no time allotted for an intensive course in historic costume, but, I hope that such a course will be a part of the normal course at least in the near future so that the student will ultimately have a broader background and fuller foundation for her advanced work in the normal department.

In conclusion then I would say since dress design is first of all an art problem, one cannot disassociate one from the other in presenting a course in costume design, and such courses as the above offer opportunity for broad educational values in imaginative stimulus and mental enrichment as well as giving technical training. On the other hand, the technical phase of the work is of great importance. It should not be taught, I believe, purely as an art course as too often the art instructor has little, if any, knowledge of materials. Therefore the instructor of costume design should be one who knows the constructive side of the work as well as how to apply the art side.

It is my belief that every artist owes it to himself and to his time to develop to the fullest his individual expression of the best of his time and place; for only so, and especially so in a democracy, shall the race reach the full aesthetic expression of its own idealism.—*Irving K. Pond.*

Smith-Hughes Work in a California Community

F. R. Love, Director of Industrial Arts, Stockton, Cal.

BEFORE going into detail about our Smith-Hughes work, it is best that I show some reason for wanting it. The best way to do this is to give some definite idea about our city and its industries.

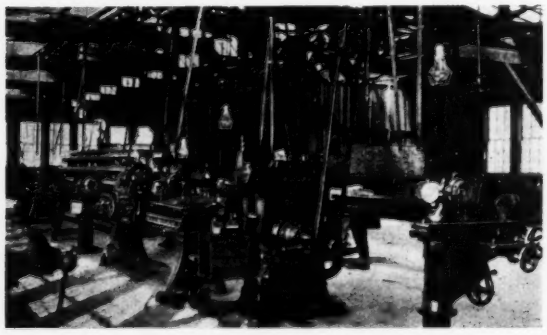
Stockton is a city of 50,000 people situated on the San Joaquin river in the central part of the state. It is surrounded by thousands of acres of California's best soil. It has three railroads connecting it with the east, and a waterway connection to the coast.

Besides being an agricultural center it is known all over the west for its manufacturing. We are a tractor center and pride ourselves on giving to the great war the big idea of the Tank. The first caterpillar made was made here by Benjamin Holt of the Holt Manufacturing Company. This is an immense plant now employing hundreds of men. With this plant we have the Samson plant that make the Samson Sieve Grip Tractor. This is getting to be a large concern and is employing a large force of men. The Groyer Tractor is to be manufactured here soon and we expect it to employ a large number of skilled workmen.

The combined harvester business is growing here very rapidly. The Holt Co. have several different kinds of harvesters that they make. The Harris Mfg. Co. have increased their output about one hundred per cent in the last two years and contemplate still greater developments for the next two years. They make both grain and bean harvesters.

With these plants we have the Stockton Iron Works, Geiger Iron Works, Sterling Iron Works, Monarch Foundry, Engineering and Foundry Co., Patterson Glass Factory, Sperry Flour Mills, National Paper Mills, and many small concerns employing a large number of skilled workmen.

Before any recommendations were made for this work a complete industrial survey of the city was made. I visited all the industries in the city and got the exact number of skilled workmen employed in them. I found the majority of men working in the metal trades and our schools were equipped to do only woodworking. These figures will give some idea of the condition found.



Interior of Shop Built for Industrial Arts Department.

Garage Helpers	250	Machinists	1100
Pattern Making	85	Foundrymen	681
Ship Building	75	Blacksmiths	410
Cabinet Making and Carpentry	400	Garage Mechanics	150

I also found that there were 8,000 automobile owners in our county.

While making these visits to the different plants I had a chance to meet the shop managers and superintendents and to talk over industrial education and its application to local needs. I got their ideas of what they thought could be done and just what they would recommend starting.

After I had collected all this data and talked things over with the shop men, I met with the board of education and made recommendations for the new courses that I thought ought to be started. They were all very much interested in the movement and immediately appointed a committee consisting of the superintendent of schools, the principal of high school, the principal of night schools, and the supervisor of industrial education, to meet with the manufacturers and discuss industrial education and its application to local needs. Following this meeting the committee reported back to the board. The board then expressed a desire to meet with the manufacturers. The committee then arranged a joint meeting of all, and invited our State Commissioner of Industrial Education, Dr. Edwin R. Snyder, to meet with us. Before the meeting we sent each manufacturer a letter and asked him to think over the questions asked and to discuss them freely at the meeting. These are the contents of the letter sent:

Dear Sir:

You are invited by the Board of Education to meet with other representatives of Stockton's leading industries in a conference which has for its purpose a closer cooperation between industrial education and the manufacturing plants of the city.

The following questions are suggestive:

1. What can the schools of Stockton do to produce intelligent workmen for our industries?
2. How should we equip our schools for such work?
3. How much time should be given to this work?
4. What work should be started at once?
5. What industrial subjects do you consider most important for your employes to study in evening school?
6. Would it increase the efficiency of your foreign-born employes to give them a more thoro knowledge of English?
7. To what extent will the employers and manufacturers cooperate with the industrial department and the evening schools?

We hope that you will be able to attend and take part in the conference. We believe that you can help us in organizing industrial training which will benefit both the young man and the industries of Stockton.

At this meeting Dr. Snyder explained just what the Smith-Hughes bill is and how to apply it to local needs. He told how the work was started in different parts of the state and what he thought we could and ought to do. All the questions in the letters were discussed and we all arrived at the same conclusion that something should

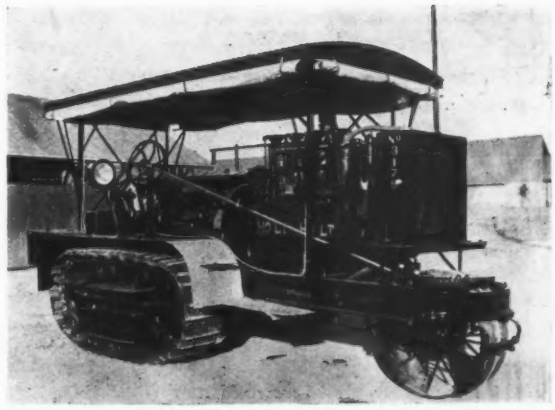
be done for our boys who are going out into our industries.

After this meeting the manufacturers met to see what they could do to help the board start the work. We then had another joint meeting and the manufacturers stated to the board just what they would do to help us. Here we found a wonderful spirit of cooperation. They offered us all the assistance that any one could expect, from using part of their shops to giving us equipment. One large firm was very generous, they offered half of our equipment very cheap, and agreed to give us work to do for them, to pay for it. This offer held good only providing that we have a building ready to start the work in by the time the next term opened. We accepted their offer and my assistant and I started to work up some plans for a new shop. The different manufacturers gave us plans of their shops and we designed a building that met the approval of both the school board and the manufacturers. The contract was let and in sixty days the building was ready for occupancy.

The machinery was ordered last spring and this fall the boys with the help of their instructor installed all of it. It is now running and consists of the following machines:

1—Universal Milling Machine.
1—No. 1 Power Hack Saw.
1—Tool Post Grinder.
1—Small Tool and Cutter Grinder.
1—No. 3½ Arbor Press.
1—Electric Drill.
1—Grinder.
1—Steel Forge.
1—16″ Plain Crank Shaper.
2—10 H. P. Motors.
1—18″ Lathe.
1—14″ Lathe.
1—16″ Lathe.
1—16″ Lathe.
1—Hand Milling Machine.
1—Single Spindle High Speed Drill.
1—Double Spindle High Speed Drill.
1—Heavy Duty Drill.
10—Benches with vises and cast iron legs.
1—12″ Speed Lathe.

Our work is all furnished us by the different manufacturers. We do it on a commercial piece rate basis. The school is paid the same price per piece that the firms pay their own mechanics. All of the work has to



A Type of Machine for Which the Students Supply Parts.

stand inspection. The boy is held up to the same standard of efficiency that the shop man is. So far very few parts have been condemned. We expect by this system to pay for our present equipment and to buy new equipment as the department grows. The work was held up so much the past winter on account of sickness that we have been unable to determine our earning capacity.

In planning shop courses, we go over all our courses in detail with every shop foreman from whom we get work. Each of them gives us a man to pick castings that will fit into our different courses. So far we have been able to get just the right kind of work for every machine. The boy is started in on the most elementary work, and as soon as he shows any indication of commercial speed and accuracy, he is given new work and a chance to change machines. We are given enough castings of one kind to give a boy a chance for speed. All the boys are given time cards and required to keep their exact time on every piece of work. Before any new kind of work is started the instructor gives a short lecture on it and notes are taken. These notes are kept and turned in whenever the instructor thinks best.

Our instructor of machine shop work is a practical man and an excellent teacher. He has worked with men for years and knows how to handle a class of boys and gets real work from them.

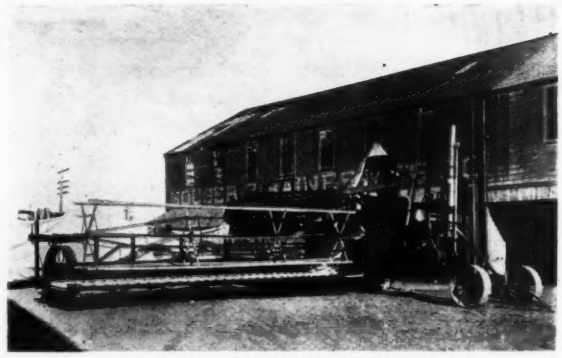
The academic end of the work is run independent-

The Stockton School Shop.

ly of the regular high-school faculty. The assistant director takes care of the shop mathematics and drawing. He has worked in practical drafting offices. The drawing is made to apply directly to what is being done in the shop. The mathematics are applied wherever possible. The classes are made up of such a variety of mentalities that it is hard to do real classwork.

The science and English work is done by a very capable teacher who has had three years of experience in our prevocational school. The English is applied to the work and made just as attractive to the boy as it is possible to do. It is a little harder to get results in science. We are now working up a course in it that we hope will arouse the interest of the student.

We have two full-time classes in machine shop work and one in carpentry. The latter was started last year.



A Machine for Which the Boys Supplied the Parts.

Next year we want to build an addition to our machine shop and start classes in tractor and automobile work.

THE HIGH SCHOOL LUNCH ROOM

Victor Randel, Principal of University High School, Columbia, Missouri

THE University High School, which is connected with the School of Education of the University of Missouri, has a lunch room. Many high schools and many elementary schools have lunch rooms. Some lunch rooms are used primarily to give girls experience in setting a table, some are used on special occasions, such as school board meetings. Girls are actually given the experience of preparing a meal on such occasions to demonstrate how useful and practical is the art of cooking in the school. Many lunch rooms serve large numbers of students; but in such cases the food is usually prepared by a specially employed cook. In many cases the girls in the home economics department assist in serving the lunches. This, as we must agree, is very commendable and undoubtedly helps our girls to become better home makers.

Dr. J. L. Meriam, superintendent of University Schools of the University of Missouri, conceived the idea of making the work even more practical by giving the girls of the home economics department the opportunity of preparing food each day to be served in the high school lunch room. The result is that Miss Margaret Bostian, the supervisor of home economics, has so arranged her course in cooking that the food to be prepared each day consists of a menu sufficient for an entire lunch. At the same time this menu must meet the requirements of the course of study provided for under the Smith-Hughes law. The food must also be of such quality that the students and teachers who patronize the lunch room will continue to come day after day and pay their money for it rather than get their lunches somewhere else. The lunch room must be, in the main, self supporting. It must pay such bills as for groceries used, for ice used and it must pay two boy students who wash the dishes. These bills are paid at the end of each month. All students and teachers pay their lunch bills promptly at the close of each month.

To meet all of these requirements necessitates some fairly accurate calculation on the part of the home economics teacher and her students. A menu is made out each week which shows the menu of each day for that week. (Fig. 1.) It is posted on a bulletin board where all students and teachers may see it. In a box near the bulletin board is a pad of thin cards. These cards are used by students and teachers to place their lunch orders. Each item on the menu is priced separately. Any part of, or the entire, menu for any particular day may be ordered. Orders for lunch must be made by 9:30 o'clock on the day wanted. This is a necessary measure in order to prevent the waste of any food. It also insures the customers against the possibility of having to eat "warmed over" food the following day. Some students bring lunch, but wish to order only a glass of milk or a cup of chocolate. Any student who brings an entire lunch is given a plate, a napkin and a glass of water. Students from the country are encouraged to bring such farm products as potatoes, vegetables and eggs. They are given credit on their lunch bills for such products.

Before 12 o'clock each order is filled and placed on a long table; each customer finds his own lunch and takes it to the dining room. In the dining room each table is large enough to accommodate four people. A teacher is in charge of this room. It is her business to see that every one is comfortably seated and supplied with such articles as silverware, a napkin, and a glass of water.

This method of conducting the cooking part of home economics has many advantages over the ordinary laboratory method in which the student is provided with individual equipment, and in which each day's work or lesson is only an "experiment." Here the kitchen is equipped with two family-size gas ranges, three sinks, four cook tables on casters and such other equipment as is found in any well organized home kitchen. (Fig. 2 shows a section of the kitchen.)

Menu.

Monday.

Escalloped Cabbage	.06
Salmon Salad	.06
Toast	.04
Tomato Soup	.05
Apricots	.06

Tuesday.

Macaroni Cheese	.06
Muffins	.02
Butter	.01½
Perfection Salad	.05
Sweet Potato Puff	.05
Hot Chocolate	.05
With Marshmallow	.05½

Wednesday.

Nut Loaf & Tomato Sauce	.06
Mashed Potatoes	.04
Hot Chocolate	.05
With Marshmallow	.05½
Drop Biscuit	.02
Butter	.01½
Peaches & Cookies	.05

Thursday.

Creamed Peas & Toast	.06
Cheese Souffle	.05
Waldorf Salad	.06
Hot Chocolate	.05
With Marshmallow	.05½

Friday.

Baked Halibut, Tomato Sauce	.06
Boiled Potatoes	.04
Butter & Toast	.03
Hot Chocolate	.05
With Marshmallow	.05½
Custard & Cookies	.05

Fig. 1. Typical Menu.

Each day's work consists not only of an experiment, but of a complete job to be done. This was well illustrated just recently. At about 11:30 o'clock one of the girls from the kitchen came in a great hurry to the principal's office and announced that unless some more cornstarch could be had at once the pudding could not be made to thicken in time to be fit to serve by 12 o'clock. The girl was allowed to go to a nearby store and get the necessary cornstarch. The job was finished and the pudding was served at the usual time.

FOURTEEN POINTS ON THE VALUE OF ART STUDY.

1. Education enriches life. All people are not alive to the same degree.

2. We get our education thru seeing and the other sense perceptions.

3. We see what education trains us to see. The mind comprehends only a part of what the eye tells it.

4. Drudgery is a means to an end. That end should be art, or utility, or both. It takes some drudgery to develop our natural art talents.

5. Industry expresses thought.

6. "Life without labor is guilt."—Ruskin.

7. "Labor without art is brutality."—Ruskin.

8. Art is a spirit in the doing of things that raises industry above drudgery.

9. If our education teaches us to see beauty, we live in a world of beauty, as we each live in the world that we have learned to see.

10. To try to express beauty helps us to see it and to produce it.

11. Each student must educate himself. Parents and teachers may only help. And—too much helping hinders.

12. Learn to see the things you do and to listen to your own music.

13. The imagination is useful in life and needs education. Before we actually do anything, we plan it in our imagination.

14. If we learn to see beauty and to imagine beauty it is easy to express it in the things we do and thus raise our work from the level of pure drudgery into the realms of art. Thus life, to us, becomes worth living and we ourselves more worthy of life.

—*Mrs. Maud Miles*, Kansas City, Mo.

Fig. 2. Interior of the Kitchen.

INDUSTRIAL-ARTS MAGAZINE

Board of Editors

E. J. LAKE S. J. VAUGHN

W. H. HENDERSON

EDITORIAL

KEEN-EDGED TOOLS.

We have been interested in the use of a term by writers on educational matters in the attempt to pronounce the distinctive value of the academic subjects. These subjects have been called "Keen-Edged Tools" of education. Of the industrial occupations, agriculture seems to bear the most significant analogy to education as a process of development in contrast to the arbitrary readjustment or revision of material. Agriculture is the cultivation of natural forces: the development of potential values under favorable conditions. So is education!

In agriculture, the peculiar demands of each kind of vegetation must be understood and cared for, with a due consideration of native environment and function. So, in education, the peculiar needs of each individual must be considered as to capability, environment, and function.

What teacher of experience has not met with astonishing evidence of the infinite variety of potential forces in the youth who comes to the school for development? Few experienced teachers are ready to pronounce any one of the academic subjects a "Keen-Edged Tool" for general indiscriminate use. Rather, they feel the need of recourse to a variety of subjects in their appeal to various pupils.

The analogy between a school subject and a "Keen-Edged Tool" fails lamentably when the educational process is rightly considered. The pupil is not to be operated on with "Keen-Edged Tools" and fashioned to a common standard of academic formality. We question seriously whether any one school subject is essential to the education of every individual. It is the theoretical educator, rather than the experienced teacher, who imagines that the various natures within human nature can or should be shaped to a common form.

WHICH IS MORE IMPORTANT, THE BOARD OR THE BOY?

There are still a good many teachers who have not learned that boys in the seventh and eighth grades are *not* men, and that mere skill in the handling of tools is not the primary consideration in those grades. Furthermore, they have not learned that skill in woodworking, as in penmanship, comes slowly and is not achieved in the first problem or in the first few lessons.

We still hear of teachers who demand the mastery of one abstract, technical process before permitting attempts in any others. A case in point is where a teacher is said to have kept boys four or five weeks on the first planing exercise in bench work in the attempt to have the little blocks of wood perfectly squared up.

The fact that such a procedure might dishearten and disgust boys at this particular age and even drive them from school seems to impress such a teacher as of little consequence compared to a slightly defective piece of workmanship.

Teachers should understand that skill in the manipulation of tools is but one of several important considerations in the teaching of manual training. *What happens to the pieces of wood is of infinitely less importance than what happens to the boys.* Any sort of manual training in the grades is but a means of enriching the pupils' experiences and habits by the use of the materials and tools of industry, and the final test of its value is the influence it exerts on those engaged in it.

A piece of work that would be a disgrace and an injury to one boy might be highly creditable and beneficial to another. The teacher, therefore, must be governed by the requirements of the boys rather than by the necessities of tools and materials, because in the grades the purpose and attitude are entirely different from those among older people in trade courses and industrial schools and perhaps in high school.

There is no excuse for teachers of long experience who have not learned these elemental things and who insist on sacrificing everything else to mechanical skill and the absolute requirements of blocks of wood.

JACKS OF MANY SUBJECTS.

One lamentable tendency in the way of economy in school affairs is evident in the demands put on young teachers to teach several school subjects. That school official who stands boldly for well-prepared teachers of one subject only will build on a substantial principle.

In a summer class registration recently taken, it was discovered that fifty per cent of the teachers were taking short summer courses of eight weeks in subjects in which they had no previous experience or knowledge, in order to fill positions in which instruction in these subjects was demanded of them.

The multiplication of school subjects is at present so urgent that many schools are overtaxing the ability of their teachers in the effort to offer a great variety of courses. We believe it would be far better for schools of limited facility to offer fewer subjects. No teacher can become proficient in any subject in one short summer session. May we not gain a lesson from the demands of vocational instruction and not become jacks of many subjects?

INTOLERANCE.

A significant and amusing incident is reported by one of our soldiers. When a transport full of American doughboys arrived at a foreign port, they were so eager to land and stretch themselves that the commanding officer ordered them to march thru the city without first

securing the permission and cooperation of the city authorities. The result was the utter confusion of traffic, for in America the rule of the road is "keep to the right," and in this foreign city, all traffic held to the left. In the words of our returned soldier, "We turned that old town wrongside out!"

It has been predicted that the proverbial American intolerance of foreign customs would be overcome by the protracted visit of so many American soldiers to Europe. We surmise this prediction has not come true. In place of acquiring admiration or even toleration of European customs that differ from our own, the American soldier is returning with the same exclamation we have heard from the summer tourist, "I thank God that I am an American!" Surely the advocate of European preference will have small hearing from the returning soldier, and the teacher who has traveled abroad extensively and is fond of reviewing the sights and accomplishments of foreign countries, may well withhold his experience.

WOODWORK IN INTERMEDIATE GRADES.

FORMAL courses in woodworking, let us repeat, have no place below the sixth grade, and are not the best by any means that can be done for sixth grade boys.

It is a common complaint of manual training teachers, nevertheless, that while they haven't sufficient help and time to do justice even to the seventh and eighth grades, they are yet required to try to teach benchwork to very large classes of fifth grade children.

The folly of trying to give a course of so many minutes a week in benchwork to children of the fifth grade would seem to be so apparent to school people as to need no argument.

There can, of course, be no objection to fifth grade children's having experience with woodworking tools, but such experience should be of the informal type and deal with such projects as require but little skill and accuracy of manipulation. Moreover, the constructive work should by no means be confined to work in wood.

Every grade school building should have a kind of all-purpose shop supplied with varied equipment and materials, where the regular teacher could take classes below the sixth grade for work in wood, metal, textiles, and all kinds of materials that may be used in constructive work.

But when manual training teachers have insufficient help and time to take care of these grades where a certain amount of technical skill and knowledge is required, they should not be burdened with the worse than wasteful courses in woodworking for fifth grade children.

INDUSTRIAL ARTS.

A NEW era is dawning in the industrial arts field; war brought the opportunity. The war forced us to choose between aping Europe again now that the job over there is finished, or standing upon our own ability in the broad field of high class industrial art production and furnishing Europe from here. The schools must get to work in this serious business. The general schools must make their work in drawing useful; the schools for manual craftsmen must be busier and harder at work than ever; the schools for teaching designers have the greatest task for they must assure for us fine design for production on a large scale. And for this great work, which must be got under way immediately, our present schools are hopelessly insufficient in number and individually inadequate for the task. We have not a half dozen; we need a hundred even now. Where are the great men who can see America's opportunities? Where are the educators that can lead and mould public opinion? Where are the long-headed manufacturers who have failed to regard schools as an asset yet who cry for designers now that Europe has called them back to defend the schools that trained them? Are there no giants among us who will assure the future of America in this field by acting at once? Let us have schools of industrial art, always more schools, and give them to us now.—*Richard F. Bach.*

A CONTRADICTION?

On pages 302 and 303-5 appear articles which are apparently direct contradictions. They have been placed side by side deliberately in order to bring out the viewpoints of their authors, who are respectively the principal of a high school and the head of the manual training department of a high school.

It is hoped that readers will express themselves freely on both sides. At a later time we shall in all likelihood present an analysis of the situation.

DON'T BOAST, BUT DO.

The greatness of our country, yours and mine
No matter where our natal place may be,—
Its plains so vast; its hills; its mountains high,
Their loads of treasures in the waving grain,
The lowing herds, the wealth beneath the ground,
The teeming cities, whirring mills,—no help
From us has had to make it great.
Don't boast! To us belongs no credit for God's work!

Don't boast, but do.

Our country's great because of its great heart;
A heart of hearts, rolled in one, of all
Great hearts of its great sons of toil and desk;
A heart which beats for justice, truth, and liberty,
True freedom for the world at any cost
Even to that great one of life itself.

Don't boast, but DO.

For we have given little to the whole
Which makes our country great. Our years
Have been too few, our deeds too small
As yet, to boast. But DO we can with all
Our might our simple, homely, daily tasks
In school or shop, in street or home, to keep
Our country great and strong and true and pure
For the next great trial which may come.

For the prevocational boys of Boston by Edward C. Emerson, First Assistant Director of Manual Arts.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

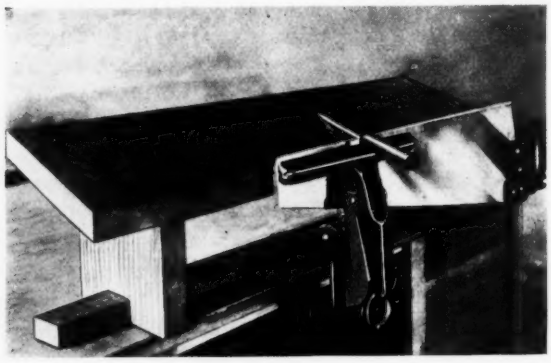
Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

SAW FILING GUIDE.

Designed by De Witt Hunt, Supt. of Shops, Oklahoma A. & M. College.

In an agricultural school where farm woodwork is taught and where teachers of manual training are trained it is necessary to teach saw filing to a great many students. While there are saw filing guides on the market, it is poor pedagogy to teach saw filing with them. Yet the process of saw filing is so complicated that it is very difficult to teach without some mechanical device. With this problem of teaching in mind the author of this article devised the saw filing guide shown in the drawing and photograph on this page.

In filing a saw it is best to joint it as lightly as pos-



THE GUIDE IN USE.

WANTED: THE "BEST" OF PROBLEMS

What have been the most effective problems and projects made in your classes? Why have they been successful? In what way have they been best?

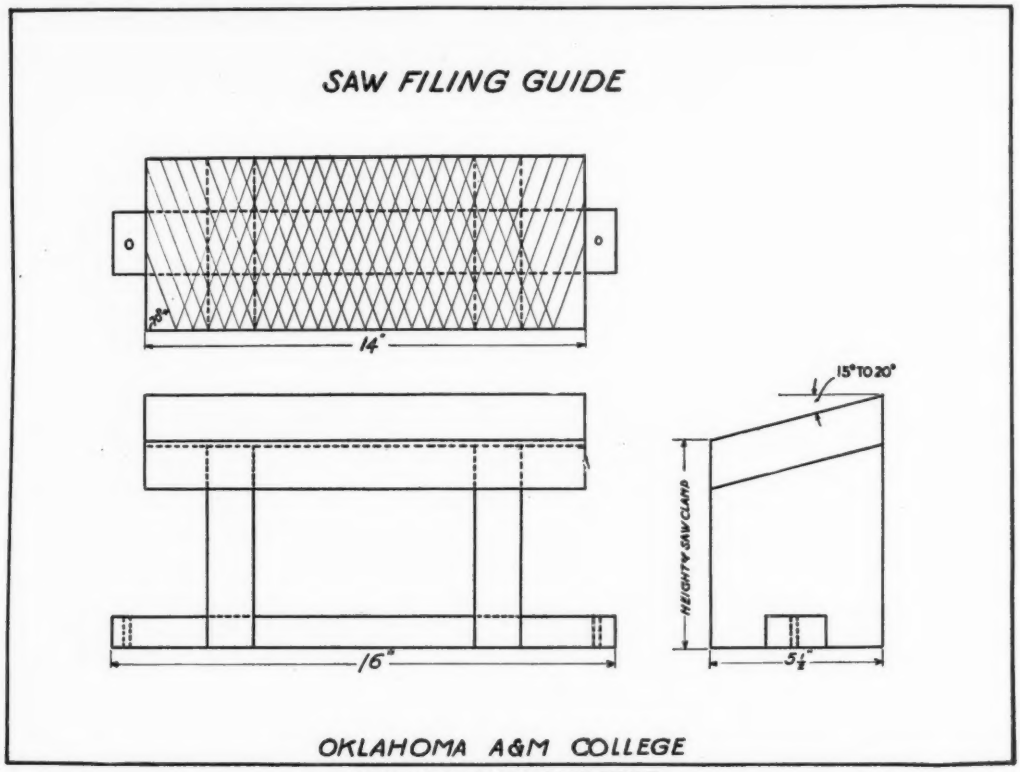
THE INDUSTRIAL-ARTS MAGAZINE is interested to learn what problems instructors consider their "best" and to publish a selection of those received in the Problems and Projects Department during the coming six months. For the "best" each month a check of $10 will be sent; for the second best $7; and for all others, space rates will be paid. Problems will be judged on the basis of technical excellence, educational value, originality, utility, design, finish, beauty, economy. The editors of the Magazine will be the judges.

All problems submitted should consist of a black-and-white working drawing, or a tracing, a description of not more than 300 words, and if convenient a photograph. The description should include a statement of the particular points which made the problem successful and such details as are needed to make the construction and finish of the article intelligible to shop teachers.

Problems in bench work, machine shop, patternmaking, cooking, sewing, millinery, forging, basketry, book binding, printing, leather work, pottery, cement work, cabinet making, woodworking, etc., are acceptable.

Problems may be submitted at any time up to December first, and any person may send as many as desired.

Address all correspondence to Managing Editor, **Industrial-Arts Magazine,** 129 Michigan Street, Milwaukee, Wis.



DETAILS OF SAW FILING GUIDE.

sible, just enough to touch each tooth. This leaves a small flat on each tooth which is of great help. In filing a cross cut saw there are three angles to consider: First, the angle of the file with the horizontal plane; second, the angle of the file with the vertical plane perpendicular to the face of the saw; third, the angle of the face of the file with the line of teeth of the saw. The first two of these angles are determined definitely on the saw filing guide by the slope of the top and the lines drawn on the top. The third angle which determines the amount of rake the saw has, is the only one this guide does not determine. This angle should be from 65 to 75 degrees to the line of teeth, and should be different for different woods. In filing with this guide, begin at the point of the saw, hold the file parallel to the lines on the guide and also to the surface of the guide. Determine the angle of the sides of the file and endeavor to keep this angle the same, testing occasionally by setting file down in the first teeth filed. File each alternate space till half of the flat on each tooth has been filed away. When all filing is done on one side of saw, reverse saw and file in same manner, stopping file at the instant flats on both teeth are filed away, thus making all teeth precisely the same length.

A LIBRARY SEAT.

Roy H. Neff, Director of Manual Training, Bismarck, N. Dak.

The library seat of which a detailed drawing is published on this page was made by the writer's classes for the high school library. The mill bill gives sufficient details for any instructor who might be interested. The problem was developed by first studying the needs of the library for seats, then proceeding to make freehand sketches from which completed mechanical drawings were developed and the work was done.

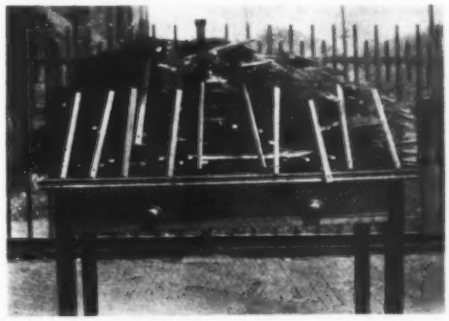
The seats were stained mahogany color and the panels were painted white and enameled. The stained portions were given two coats of shellac and several coats of varnish, and were rubbed to produce a dull finish.

SWAT THE FLY

W. L. Taylor, Manual Training Teacher, Burns School, Chicago, Ill.

During the spring clean-up week in Chicago, the boys in the manual training Department of the Burns School, made fly swats for the school.

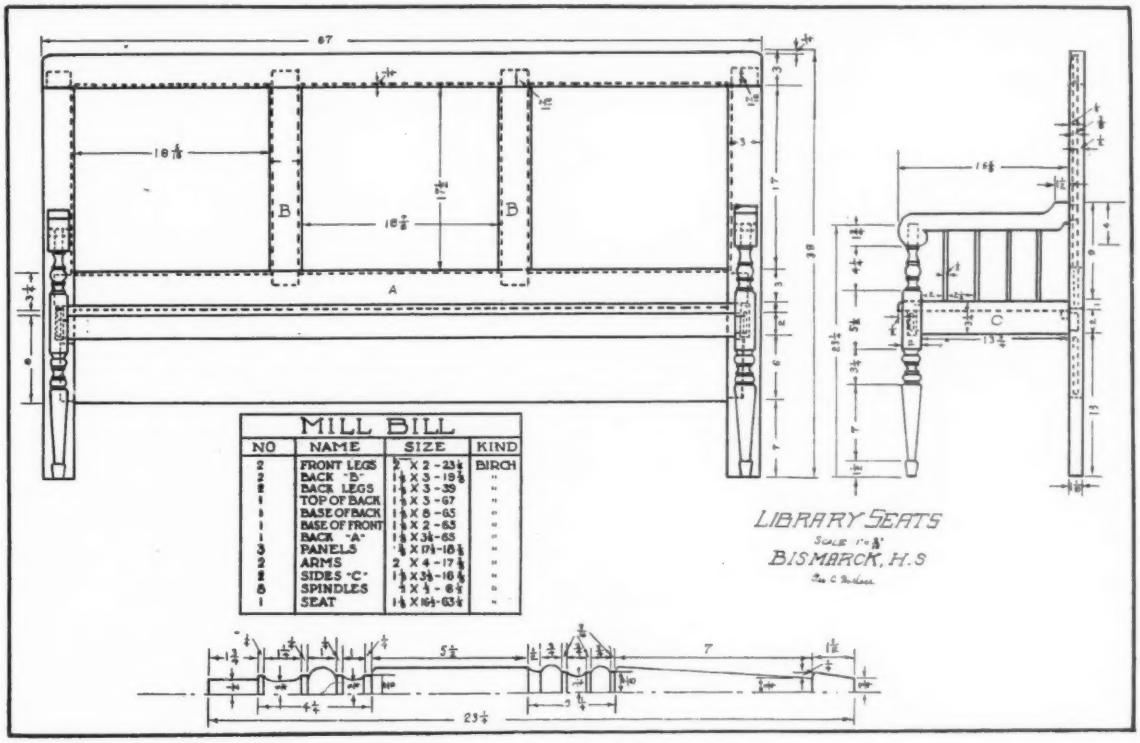
A simple and convenient design was chosen. Screening was cut into strips fourteen inches long and five inches wide, thus getting six swats from screening thirty inches wide. The fourteen-inch strip was folded in the center crosswise and the two loose corners folded over the



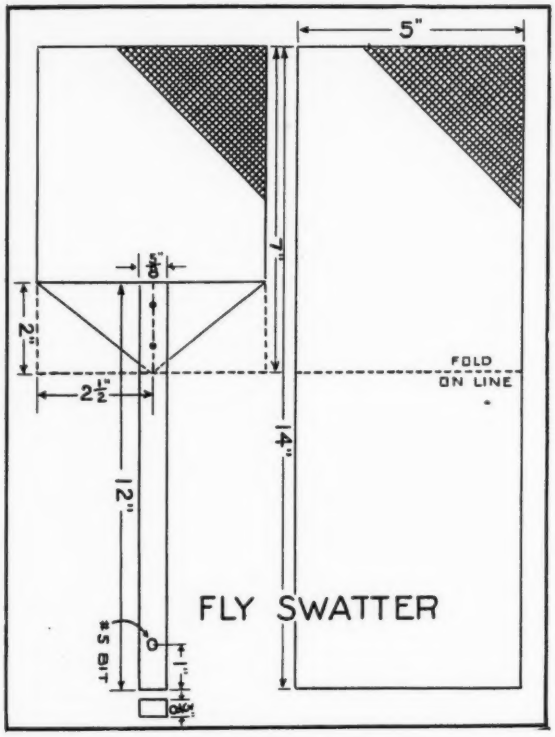
A LOT OF "SWATTERS" MADE BY THE AUTHOR'S PUPILS.

center (two and one-half inches), and two inches from end.

The handles were made from soft wood 12″x$\frac{5}{8}$″x$\frac{3}{8}$″. An incision was sawed two inches in length in one end, into which the folded end of the swat was securely fastened by small brads or staples. In the other end of the handle, a hole was bored in center, one inch from the end with a 4/16″ bit for convenience in hanging up the swat. If desired, the edges of the swat may be bound with tape or stitched over with cord.

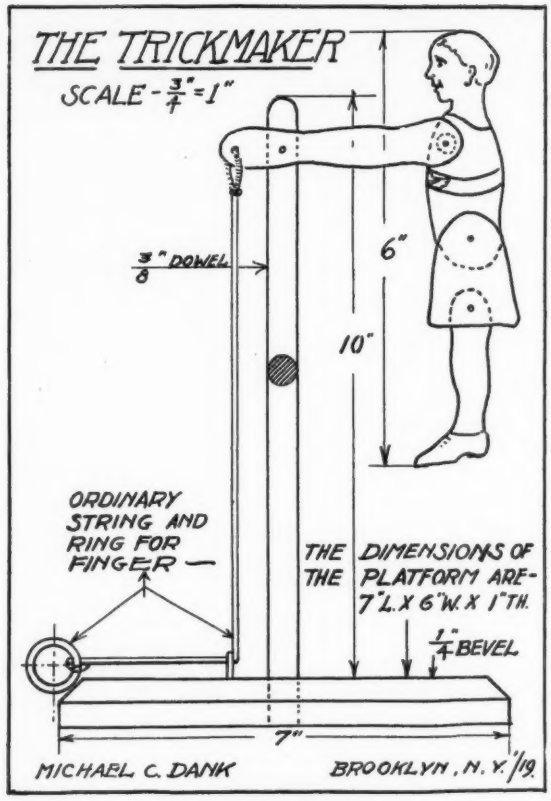

MILL BILL
NO | NAME | SIZE | KIND
2 | FRONT LEGS | 1½ X 2 - 23½ | BIRCH
2 | BACK "B" | 1½ X 3 - 19½ | "
2 | BACK LEGS | 1½ X 3 - 35 | "
1 | TOP OF BACK | 1½ X 3 - 67 | "
1 | BASE OF BACK | 1½ X 6 - 65 | "
1 | BASE OF FRONT | 1½ X 2 - 65 | "
1 | BACK "A" | 1½ X 3½ - 65 | "
3 | PANELS | ¾ X 17½ - 16½ | "
2 | ARMS | 2 X 4 - 17 | "
2 | SIDES "C" | 1½ X 3½ - 16½ | "
6 | SPINDLES | ¾ X ½ - 6½ | "
1 | SEAT | 1½ X 16½ - 63½ | "
LIBRARY SEATS
SCALE 1"=1"
BISMARCK, H.S.

DETAILS OF SCHOOL LIBRARY SEATS.



DETAILS OF THE FLY SWATTER.

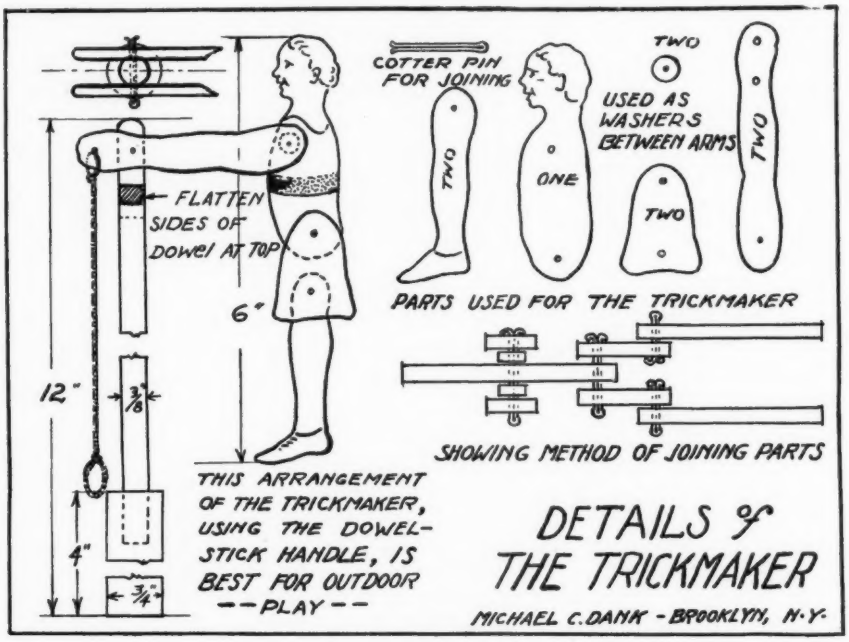
"Why we should swat the fly" was discussed in the classrooms by teachers and pupils, thus the pupils received a thoro understanding of the fly as a deadly germ-carrier, and that the killing of the fly early in the season means the destruction of millions. After learning what a great enemy the fly is, a swat was given to each family represented in the upper grades and the children marched forth upon the dangerous foe.



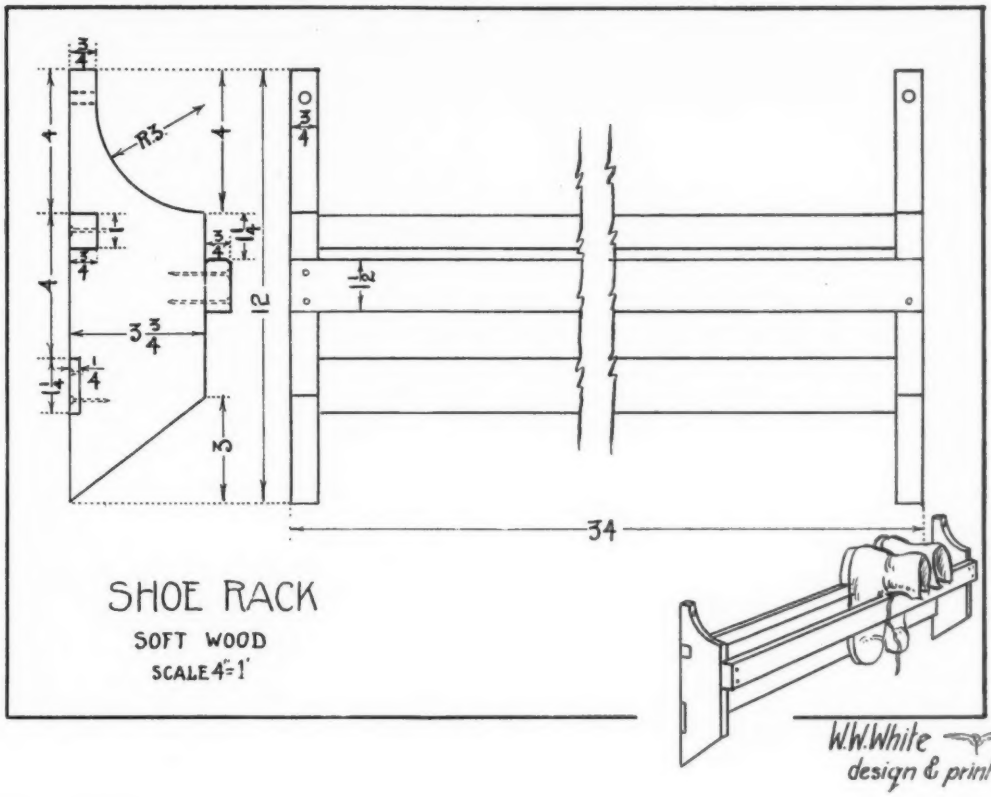
THE TRICKMAKER

Michael C. Dank, Instructor, Manual Training, Brooklyn, New York.

A big feature of this toy lies in the fact that the trickmaker can be used in different ways to suit the boy at play. At home, the pole can be inserted in a board measuring about 7"x6"x1", with a hole bored in the center to receive the half-inch dowel rod. The rod, however, is

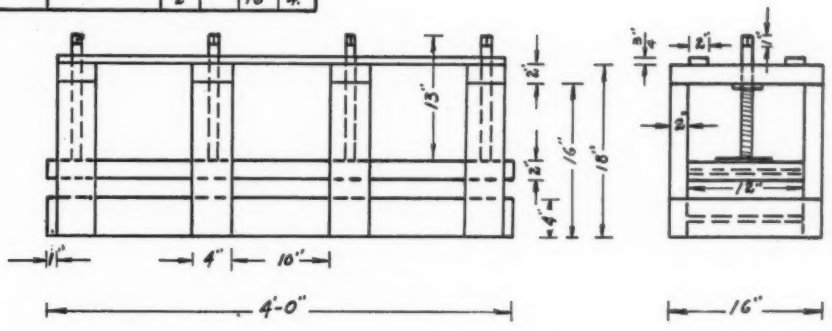


DETAILS OF "TRICKMAKER" TOY.



STOCK BILL.

Use	Material	T.	W.	L.	No.
Bed	Y. Pine	4"	16	4'-0	1
Press Block.	"	2"	12"	4'-0	1
Uprights.	"	2"	4"	16"	8
Cross pieces	"	2"	4"	16"	4
Braces	"	¾"	2"	3'-10	2
Screws.	Steel	1"D		13"	4
Bearing Plates.	Iron	¼"	6"	6"	4
Floor Plates	"				4
Bolts	"	½"		12"	4
Bolts	"	½"		16"	4



Pressing screws 13" long, threaded 10". Top forged 1" square. All joints drawbolted with ½"x5" sq.hd. bolts.

GLUING PRESS.
Scale - 1½" = 1'-0"
L.F.F. Jan. 18 1914.

DETAILS OF GLUING PRESS.

not to be glued when placed into the hole. Arranged in this manner, the trickmaker can be placed on any table or stand and will serve as a very amusing toy for the playful child. When in the street, however, the trickmaker can be detached from the base-piece and used with the pole alone, with perhaps a larger dowel-piece added to the end for holding it in the hand conveniently. This arrangement of the toy is very suitable for the child's play outdoors.

Using any brilliant coloring, such as dry colors mixed with white shellac varnish and with suitable color schemes, the trickmaker appears very realistic when doing his wonderful, numerous stunts about the pole.

A SHOE RACK.

W. W. White, Waterloo, Ia.

The shoe rack illustrated in the accompanying drawing has been found successful as a seventh grade problem. The design may be varied according to the ideas of the individual boy and the only dimensions which are fixed are the thickness of the rear rail, its distance from the front rail, and its height above it.

The drawing shown provides for two pair of men's shoes and two pair of ladies' shoes—probably the proper maximum number considering present high prices.

The design shown gives an opportunity for teaching the compensating cut for economy of time and material.

GLUING PRESS.

L. F. Filested, Bellevue, O.

The press shown in the accompanying drawing, while simple in design and construction, will do anything it may be called upon to do within its capacity. It is constructed of 2″ x 4″ yellow pine thruout, but any other wood could be used. The bed is clamped together by means of ½″ iron rods threaded on both ends and fitted with nuts and washers. The uprights are also fastened to the bed by means of these same rods. The press block is assembled in the same way but is not fastened to the main frame in any way and can be removed when placing material in press or taking it out.

It was our original intuition to use one-inch iron rods threaded to fit pipe fittings to secure the necessary pressure but in assembling the press we found that bench screws gave much better satisfaction. The square thread of the bench screws allowed much more force to be applied than the thread of the iron rods as first intended.

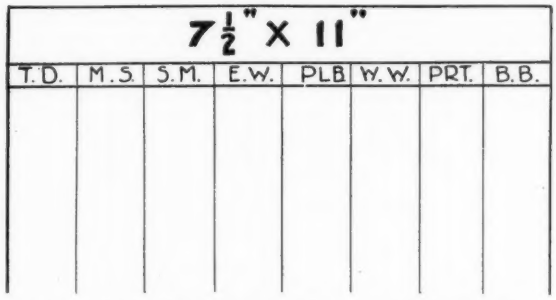


FIG. 2. DETAILS OF CARD FOR LISTING DRAWINGS.

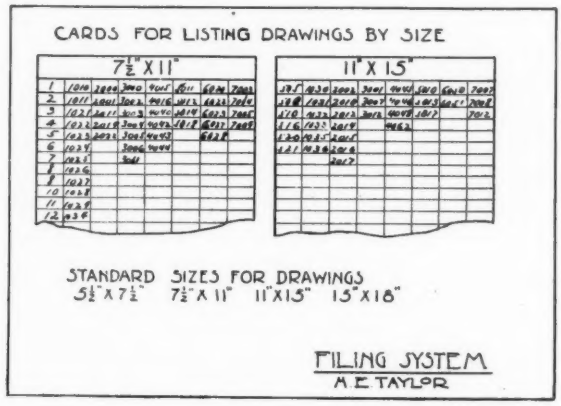

CARDS FOR LISTING DRAWINGS BY SIZE
7½" X 11"
11" X 15"
STANDARD SIZES FOR DRAWINGS
5½" X 7½" 7½" X 11" 11" X 15" 15" X 18"
FILING SYSTEM
M E TAYLOR

FIG. 3.

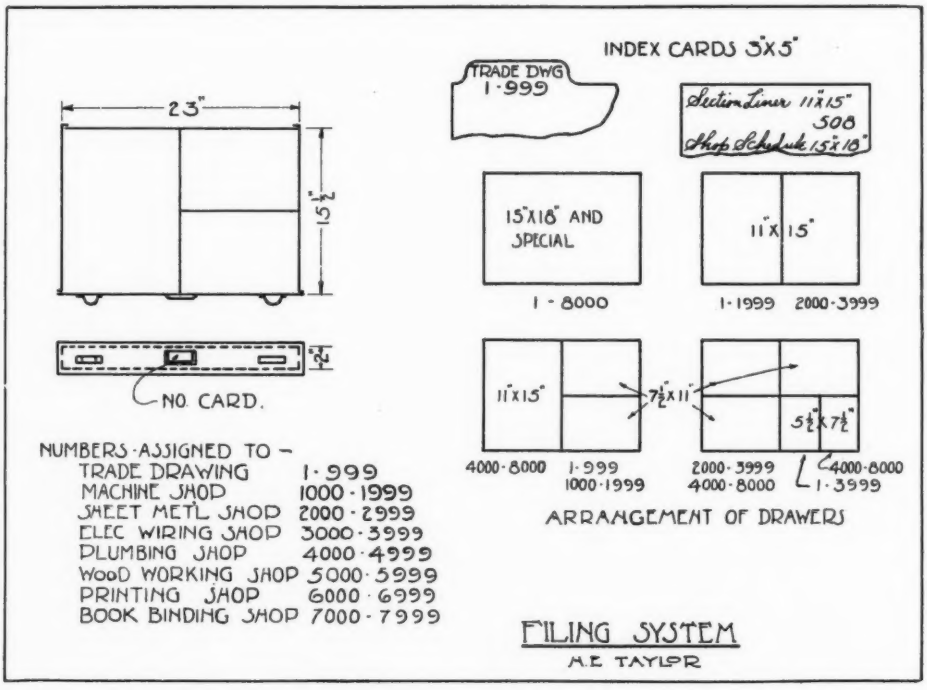


FIG. 1. DETAILS OF DRAWERS AND INDEX SYSTEM OF DRAWING ROOM FILES.

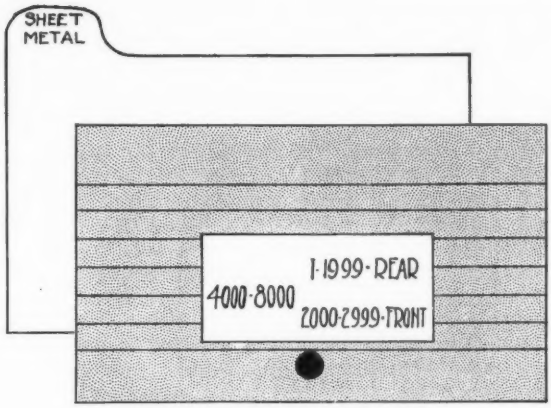


Fig. 4. Typical Index and Record Cards.

DRAWING ROOM KINKS.

Harold E. Taylor, Paterson, N. J.

The system described below for caring for tracings and blueprints has been devised for use in prevocational classes in trade drawing.

A cabinet containing four drawers as shown in the accompanying drawing, and a small card file for 3″x5″ index cards are required.

These may be made in the sheetmetal or woodworking shops. The drawer illustrated is of 22-gauge galvanized iron. A cabinet of this type costs about $2.25 for a four-drawer cabinet.

Numbers are assigned according to shops, each shop starting with an even thousand. Index cards are grouped by shop and arranged alphabetically under the proper heading. Four larger cards are also kept, one for each standard size, and the numbers are posted to these cards as they are assigned. This makes it easy to determine if all drawings are in their proper places. As the 7½″x1″ and 11″x15″ are the sizes most used, more space has been allotted for them in the drawers.

Paper and tracing cloth come in sheets 11″x15″ and also in rolls 36″ wide for the larger and special sizes. Tracing paper is bought by the roll 36″ wide and the roll is sawed in the woodworking shop, into lengths of 8″, 12″, and 16″. From these short rolls the sheets are cut as required.

This system of filing will care for 500 to 800 tracings and an equal number of blueprints. If the number of drawings becomes too large to accommodate tracings and prints in the same cabinet, they may be filed separately in duplicate cabinets with one indexing.

The student who has had some experience in handling a filing system of this kind will have a much better idea of lecturing on the part of the teacher.

TWO IMPORTANT RESOLUTIONS.

The Western Arts Association at its recent convention in Chicago adopted two important resolutions that call attention to present needs and that deserve to be brought to the attention of local boards of education and superintendents of schools. The resolutions are here reproduced in full, so that teachers of the industrial arts, drawing, and household arts may make the fullest use of them.

Necessity for Better Industrial and Applied Arts, Greater Artistic Appreciation and Better Art Education.

Whereas: It has been shown that good design and the highest type of workmanship in American manufacturers are absolutely necessary to enable the United States to hold a foremost place in the world's commerce, and compete with designers abroad; and

Whereas: The time has come when we must recognize the importance of Art in education and the value of enhancing our products artistically; and

Whereas: Necessity demands that we train designers capable of expressing artistically and esthetically, American ideas in conformity with our concepts, customs and environment in order that we develop and gain in prestige and trade after the war;

Therefore Be It Resolved: That the Western Drawing and Manual Training Association, at its convention in Chicago, May 6-9, 1919, adopt this resolution requesting that more attention and time be devoted to art education in the schools of this country;

That credits equivalent to those allowed for other subjects be given for art work in the schools; That the Boards of Education, Regents and Superintendents recognize the importance of providing better training in freehand drawing, design and color practice, and provide salaries which make possible the continued services of competent art instructors and supervisors of art and manual training, in order that the talented students may find opportunity for training that will make it possible for them to meet the demands for more efficient services in the industrial arts and the greater society.

Further Be It Resolved: That this association recommend to the Bureau of Education at Washington the inclusion of publications on art education and the training of instructors and supervisors of the arts, among the subjects on which it provides literature for the public, in order to emphasize the importance of art in education, and stimulate the respect for it as a necessary factor in industry, and in the cultural development of the communities.

Further Be It Resolved: That the members of this association, thru their individual efforts, the press, or other means, bring the above resolutions to the attention of institutions, clubs or others interested in the industrial and fine arts, and request endorsements and cooperation along the lines indicated.

Teachers' Salaries.

The Boards of Education in our several home cities would not think of cutting our salaries in half. Nevertheless, this is what has actually happened, since the enormous increase in the cost of living has cut the purchasing power of a dollar in half.

It is recognized that the schools do not exist for the benefit of the teachers. If teachers are not willing to work for the pay offered them they can stop and go into other occupations—as thousands of them have done.

But, for the benefit of the children—the future strength of the nation—it is our duty to call attention to the grave situation which has arisen.

Today the United States faces a shortage of 50,000 or more teachers. At the same time, the great war has demonstrated, as nothing else could have done, that the public schools are the bulwark of the nation—the *real* "Safeguard of Democracy."

The wonderful showing made by our boys on and across the seas, as well as the united support given them by our people on this side, are alike explained as directly attributable to the work of our democratic public school system. And the *teacher* is the vitalizing force back of this school system.

America should not allow the efficiency of the schools to be impaired thru inadequate pay for her most faithful public servants—the teachers. It is absolutely essential that the efficiency of our public school system be maintained and still further developed for the education and Americanization of *all* our people, as a means of conservation of a national asset. This efficiency is now threatened, far more seriously than our people yet realize, by the enforced lowering of the standard of personnel in our teaching force consequent upon the diminishing purchasing power of salaries which were already inadequate before recent increases in cost of living.

In view of these circumstances, the Western Drawing and Manual Training Association, in convention assembled, hereby affirms its belief in the proposition that more adequate financial support for our schools, and especially more adequate salaries for teachers, are among the most vital problems before the Nation today. The Association urges all of its members to take appropriate steps to bring this statement to the attention of members of boards of education, and of the citizens generally, in the communities from which they come. In most cases this can be brought about effectively thru the cooperation and assistance of the daily press.

ANNUAL MEETING OF THE VOCATIONAL AND ARTS ASSOCIATION OF NEW JERSEY.

James E. Gaffney, Atlantic City.

Each annual meeting of the Vocational and Arts Association of New Jersey has marked an important step in the advancement of vocational, industrial and manual and fine arts in the State of New Jersey. This year's gathering at Newark, May 23 and 24, proved no exception to the rule. It may well be said to have proved a far more important

milestone in the march of progress than any of the preceding meetings, as it presented the culmination of certain features of work done by the schools during the war and the inauguration of others.

The first general session convened on Friday afternoon, in the beautiful auditorium of the Central High School, with President Hugo B. Froehlich in the chair. There were about four hundred teachers present.

Wesley A. O'Leary, assistant Commissioner of Education, was the principal speaker of the afternoon. Mr. O'Leary congratulated the teaching body on the various lines of war work they had carried on in all phases of the vocational and industrial arts and spoke especially of the splendid work being carried on in the vocational schools of the state.

He spoke in favor of the new legislation enacted for the continuation school, requiring all boys and girls between the ages of 14 and 16 to attend school on the employers' time at least six hours a week. To meet the requirements and intent of this law will require special preparation on the part of all the schools thruout the coming year to carry out the aim of this act intelligently and effectively. Mr. O'Leary particularly emphasized the function between the state department and the schools at large as being cooperative with the teachers and expressed great appreciation of the efforts of cooperation on the part of the teaching staff.

The evening schools was a subject dwelt upon considerably by Mr. O'Leary. He said that during the past year there were only 9,000 pupils enrolled in the evening schools of the state, which with the advantages being offered in our public schools is only 2 per cent of the number that should be enrolled.

E. A. Reuther of the state department of education, spoke of holding the interest of pupils in the various lines of manual arts work and instanced a number of incidental values that should be sought in connection with this training. "Particularly in the case of 'safety' and 'hygiene' instructors should take care that every machine is as fully guarded as possible and should teach the invariable habit of care in all operations."

Mr. Reuther further emphasized the importance of opportunities afforded in vocational training for children who work together, very often under partial direction of one of their own number, in producing objects of value as essential to every day life. The Junior Bazaar, held in Newark this past season, where were featured innumerable articles made by children in the public schools, was given as a good example.

At the annual dinner to the members, Professor Noyes, a member of the federal board for vocational education, brought home to those present the close relation between the plan of rehabilitation of the soldiers today, with the object of the vocational schools in the state. His topic was "Experiences in the Training of Returned Soldiers and Their Implications for Vocational Education."

Several concrete examples of why the vocational school is essential to social progress were given by Prof. Noyes during his instructive talk. He attributed the perplexing problem of placing disabled soldiers in jobs today to the lack of vocational training in the lives of these boys before they went to war.

"Many of these men did not know any other industry save the one they accidentally fell into when they finished their common school education," said Prof. Noyes. "The result is that these men do not know about other trades. When they found themselves unable thru physical disability to follow their former line they gave up hope. A vocational school avoids such a catastrophe by giving one the opportunity of knowing and studying other lines open to him."

Prof. Noyes spoke of the utter inadequacy of our public school system in regard to practical education. "The present system does not bring the teacher in contact with the individual child. In order to properly fit a child for the position he is to occupy in the future the teacher must know his hobbies, what he likes, what he wants to do more than anything else in the world when he gets out of school. But what opportunity are teachers offered to do this?" he asked. "According to the present system if a whole class goes thru a drill properly, or makes paper baskets all perfect, that class is said to have reached a high degree of excellence."

Alexander J. Glennie, President of the New Jersey state teachers' association, in his address outlined some new educational readjustments. He made the point that vocational guidance should be a process of "evolution" rather than "revolution" and advocated the necessity of more industrial education. "In this day of more practical things in education dead languages are no longer necessary to be learned or for a person to be termed educated. 'Academic' means not the practical side of life."

"I believe an effort must be made to bring more handicraft work into the public school system. All the books in the world won't teach children certain arts and occupations. They are subordinate to the real knowledge a child gets from the contact with the articles made thru industry." Mr. Glennie gave some very interesting examples with reference to a statement he made that "energy is more essential than talent, in most cases, to produce success."

Exhibits, illustrating by means of specimens of pupils' work the courses provided in the manual arts department of the Newark schools and the arts and crafts taught in the Binet schools which are the centers for the classes for the feeble-minded, were inspected by the visiting members. Wooden toys form the school shops, posters and work of the sewing classes showing how the eye and hand of this city's boys and girls are trained, were examined with interested comment. In this exhibit also were shown the five-and-ten-cent luncheons which the girls help prepare as a part of their cooking course and which assure their having at least one comfortable and wholesome meal each school day.

The teaching of practical arts was treated from many angles in the round table discussions which was held in the Central High School on Saturday morning. Eight different

Fifth and Sixth Grade Builders of Bird Houses and Garden Sticks, Albuquerque, New Mexico.
Miss Emma Woodman, Supervisor.

group meetings were held and the members representing the various types of schools met and considered their problems. The talks and discussions were very interesting and instructive.

The meeting closed with a luncheon at Achtel-Stetter's and an address on "The Project Method in the Fine and Industrial Arts" by Dr. Kilpatrick of Teachers College, Columbia University.

"Project," as outlined by Dr. Kilpatrick, was merely the purpose of a child in doing or not wishing to do a certain thing. Until teachers learned to feel their purposes and to guide them in carrying these purposes out, they were not really doing their duty by the mass of pupils in the public schools.

Dr. Kilpatrick contended that many persons in this world are misfits. They have not been given the opportunity, thru lack of means of obtaining the proper training, to follow out any project they had in mind. In conclusion he stated that "We have the greatest chance to remake American education; of creating the independent citizen, the person who thinks for himself who won't be led by politicians, but will have definite purposes in life, thru vocational training."

At the business meeting the following officers were elected for the coming year: President, William R. Ward, Trenton; Vice-President, Dr. E. B. Kent, Jersey City; Secretary, James E. Gaffney, Atlantic City; Treasurer, C. E. Parsil, New Brunswick.

THE PROJECT METHOD IN SALESMANSHIP

H. E. Stone, Instructor in Salesmanship, Erie High School, Erie, Pa.

That tradition is most strongly entrenched in our high schools and colleges no grade school teacher will deny. The "set task, sit-alone-at-your-table" procedure is still the rule rather than the exception in most high schools. Furthermore not all teachers who realize the consequent tendency toward a selfish individualism are aware of a better method. As a result, high school students generally have some subjects in which they perform activities under dire compulsion. Most high schools have some teachers who believe in compulsion as well as in mental discipline and the majesty of the faculties.

There exist, however, reasons for optimism in the many solutions educators are offering for the improvement of our schools. Perhaps no recent contribution is better known than the project method. And, if subject matter and method are closely related, as Dr. Dewey contends, it follows that radical change in subject matter will be involved with radical change of method. That the project method means radical change will at once be evident when we consider Kilpatrick's definition of a project as a "wholehearted, purposeful activity in a social situation."

Assuming that the reader is familiar with Prof. Kilpatrick's explanation of this method of classroom procedure, this paper is offered as a "project" the "inner urge" of which is the desire to reconstruct pedagogic method in salesmanship. No attempt will be made in this article to define salesmanship, to prove that it is a science or that it can be taught to high school students. These matters are here assumed and our only concern will, therefore, be with the problem of how best to teach the science of salesmanship.

For some time it has been a matter of deep concern to the writer that all available textbooks and courses in salesmanship are based on the old psychology. They have, nevertheless, contained much valuable information about salesmanship. Their chief fault has been that none of them provide for sufficient "whole-hearted, purposeful activity on the part of the student in a social situation." They have been about salesmanship rather than courses in salesmanship. For this reason textbooks have for several years been used largely as reference works by salesmanship classes in Erie High School.

Sales talks by the students on dress goods, furs, automobile accessories, vacuum cleaners, fountain pens and scores of other articles of merchandise have long been emphasized. Students received the major portion of their training and all of their information about the commodities from local dealers. The course of study is an attempt to break away from traditional method which seemed so inadequate for the teaching of so vital a subject as salesmanship.

Early in the present school year a reprint of Prof. Kilpatrick's article on the Project Method which first appeared in the Teachers' College Record for September, 1918, was received for examination with the suggestion that I check up our course in salesmanship in the light of the method so clearly set forth therein. The truth of many of these principles was at once apparent. When students had planned their own talks and built them, had they not been more successful than when I had assigned them as set tasks? Why then should I- ever do more than tactfully suggest and then guide? In the degree in which I had succeeded in eliminating self from the success of a given undertaking (a difficult task), had not my students demonstrated increased power to bear the responsibility for carrying thru successfully each step of the project from proposing and planning on thru to execution and the judging? Was it not evident that approval and disapproval expressed by the class meant more than when expressed by the teacher? These questionings led to a modification in both subject matter and method. The result was greater confidence of pupils in teacher and of teacher in pupils.

As I write I bear in mind the fact that my students are crowding me for opportunity to present their projects. Talks on cameras, typewriters, washing-machines and what not are maturing almost too rapidly. Response bonds have been formed and are ready to act. They will be satisfied only by action. Our course is rapidly shaping itself into what we may term a project course in salesmanship. No one is permitted to build a talk unless he has a dominant purpose in so doing. Socially desirable interests of our students are coming to the surface and being utilized. Boys who are interested in automobiles and drive them daily have made a study of automobile tires and given talks on them. Heated arguments over the relative merits of Firestone or Fisk have been settled fairly and amicably. Girls whose backs have ached more than once on a Tuesday afternoon have expounded the merits of the Electric Flat Iron or the Simplex Ironer.

Alluring leads from refrigerator talks thru circulation and precipitation to the Science of Physics have been postponed by the dominant purpose to make a sale. Likewise talks on leather hand bags awakened interest in the relative merits of chrome and bark tanned leathers. Motors on vacuum cleaners and washing machines with the voltage and amperage stamped on them furnished lead into electricity. Always the dominant present purpose of the successful sale has sufficed to postpone that which was plainly irrelevant.

Years of experience in actual selling, together with training received from several concerns in preparation for selling, furnished the methods which we have been trying to approximate in our classroom procedure. At times, however, the project had been that of the teacher and not of the student. The full significance of letting each student work out his own project was not always realized. Primary responses too often determined the student's grade. Associate and concomitant responses were some times observed tho not under these names. Certainly too little attention was given to the inward thought and feeling accompanying the learning of salesmanship. Conscious aim for desirable associate and concomitant responses there was, but without guide or compass to bring us back to the proper path when we wandered. We felt the handicap of working without technique. Prof. Kilpatrick has furnished just that.

Henceforth we have a gauge by which to measure classroom procedure. Every teacher of salesmanship can use the Project Method as the student, in writing, uses the Thorndike Scale. Each succeeding class will furnish a new project. And the beauty of this standard test of classroom efficiency is that it is not a test for teachers of salesmanship alone. It applies to all subjects and to all learning whether in school or out. It compels regard for the laws of learning and rewards teacher and pupil alike.

Not all subjects permit the embodiment of idea or plan in external form as does salesmanship. Because of hearty agreement with Prof. Kilpatrick's expressed opinion that our schools need a great increase in the social activity, this was the type chosen. Because of faith in salesmanship as a valuable study for high school boys and girls and experience in putting it to the test of the project method, this was the subject chosen. It is to be hoped that others may report the

results of their work with projects of the three other types. Suffice it to say that experience in Erie High School classes in salesmanship bears testimony to the validity of Prof. Kilpatrick's contention that "whole-hearted, purposeful activity in a social situation as the typical unit of school procedure is the best guarantee of the utilization of the child's native capacities now too frequently wasted."

NEW BOOKS.

Textiles and Clothing.

By Ellen B. McGowan and Charlotte A. White. Cloth, octavo, 268 pages. Price, $1.50. The Macmillan Co., New York, Chicago.

This practical book takes up in detail the several textile fibers, the method of preparing and spinning them, and the weaving of the ordinary commercial grades of textile materials. The book is well adapted to high school use and is well balanced as between the historic and technical phases of the preparation and spinning of cotton, flax, wool and silk, and the practical operations of selecting, testing and caring for cottons, linens, woolens and silks for family and personal use. The economics and the hygiene of clothing are especially well presented and the whole is brief enough for a semester's supplementary study. A complete bibliography and glossary are included.

Imaginative Drawing.

By E. A. Branch. Paper, 64 pages. Price, 87 cents. Evans Bros., Ltd., London, England.

Presents 25 studies in imaginative landscape drawing.

Art Monograms and Lettering.

By J. M. Bergling. Paper covers, $1. J. M. Bergling, 1254 Rosedale Ave., Chicago.

This book is made up of carefully selected monograms in a wide variety of letter styles. It is intended for jewelers, engravers and commercial artists and will be found helpful in making combinations of letters for jewelry, china painting, embroidering, printing, embossing, trademarking, etc.

Training for the Electric Railway Business.

By C. B. Fairchild, Jr. Cloth, 155 pages. Price, $1.50, net. J. B. Lippincott Co., Philadelphia.

Few realize the technical skill and executive ability needed to equip and operate our electric railways. A practical railroad man, executive assistant to the Philadelphia Transit Co., has with the skill of an expert, given a detailed statement of the necessary qualifications of the officials and employes in the executive, administrative, engineering departments of a great system. Trained workers in a group of highly organized industries are in great demand. Their duties are many and complicated, but they offer inviting openings to the competent.

Even today, electricity has many applications. It promises to become the motive force of the future.

Garments for Girls.

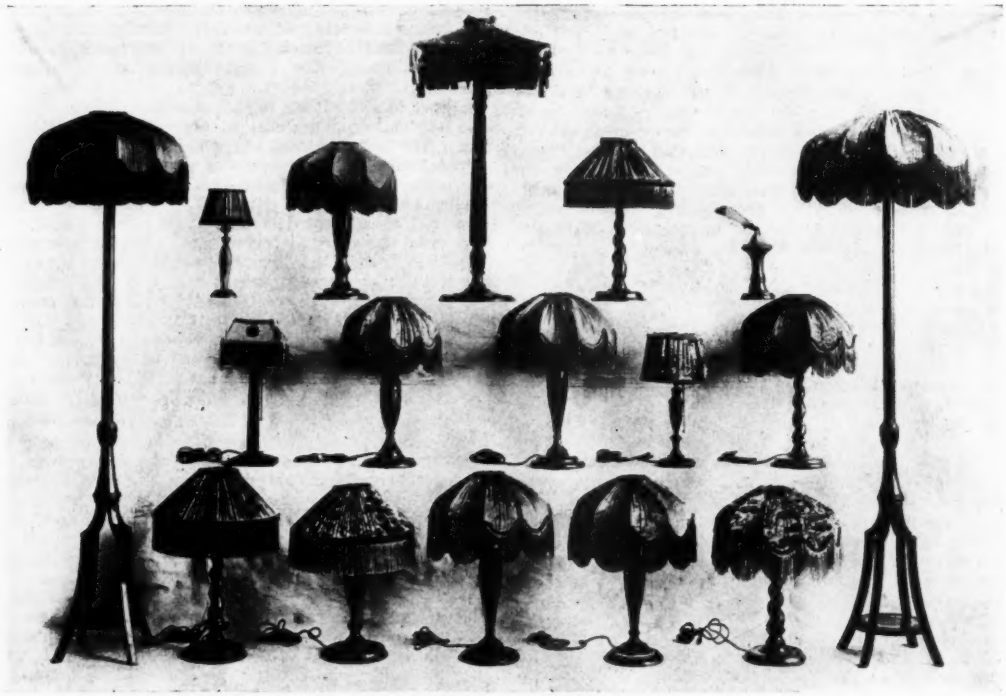
By Celestine Leontine Schmit. Cloth, xi and 249 pages; illustrated. The Century Co., New York.

The purpose of this book is to facilitate the teaching of sewing. The use of it will enable the teacher to give more class instruction than has heretofore been possible. The fundamental principles of garment making are outlined so clearly that the average high school student will not experience any difficulty in understanding them. Each lesson is a complete unit and is followed by such questions as will create thought and discussion on the part of the members of the class, and also give suggestions to the teacher. The explicit instructions and the many diagrams and photographs given in the book, enable the student to make her own patterns, construct more economically and satisfactorily the ordinary garments worn by girls; and at the same time give each garment that little added touch of individuality which counts for so much. Many short cuts have been introduced without sacrificing the standards of the work. It can honestly be said that the book is one of the best of its kind.

PUBLICATIONS.

How Training Departments Have Bettered Production, and *Efficient Training in a Large Plant*. Training bulletins of the Training Service of the United States Department of Labor. Issued by the Labor Department at Washington, D. C. Contain studies of efficient training departments in a number of large manufacturing plants, describes the methods employed and the results attained thru training.

Reconstruction in the Domestic Science Kitchen. Prepared by Helen C. Goodspeed, supervisor of home economics for the state department of instruction of Wisconsin. Issued by the state department at Madison. The pamphlet discusses the arrangements for teaching domestic science in schools and the relation of school instruction to practical home making. It advocates the group arrangement of equipment as the nearest approach to the home kitchen and as best adapted for cooking family size quantities of food.



SPECIMENS OF TURNING IN THE EMPORIA HIGH SCHOOL.
The lamps illustrated are a few of the furniture products made in the Emporia, Kans., high school under the direction of Mr. T. G. Bashaw.

American Journal of Care for Cripples. Organ of the Federation of Associations for Cripples and the Welfare Commission for Cripples. Edited by Mr. Douglas C. McMurtrie, New York City. The Journal contains an article on "Industrial Surveys of the Leather Industries with Special Reference to the Employment of the Disabled," by Mr. Gerald A. Boate, of the Department of Soldiers' Civil Reestablishment, Ottawa, Canada.

Vocational Education. William T. Bawden. Bulletin No. 25, 1919, of the Bureau of Education. Published by the Bureau at Washington, D. C. This pamphlet represents a study of the vocational education progress in the country during the past two years, beginning with the enactment of the Smith-Hughes law and ending with the inauguration of special vocational courses for the army and navy. The author, in his review, expresses regret that the program for vocational education does not as yet provide for a coordination of compulsory-education legislation, vocational-education legislation, and child-labor legislation. It discusses important factors of progress, the Federal Board, Students' Army Training Corps, Vocational Training in Army Hospitals, Special Training in the shipbuilding industry, vocational education in the navy, conferences on special phases of industrial education, the continuation school, prevocational education and the junior high school, and manual training in secondary schools.

Labor Turnover and Industrial Training. Bulletin No. 6, United States Training Service of the Department of Labor, Washington. It is estimated that the labor turnover in the country at large is about 250 per cent at the present time. The number of quittances and discharges in a factory is an index to the industrial unrest of the workers and is an important factor in high production costs. The pamphlet gives six reasons for low efficiency and points out that employers would do well to offer industrial training in order that their employes may be well trained and that they may retain them for longer periods of time. The U. S. Training Service offers to cooperate thru its representatives who are equipped to introduce training courses for manufacturers of large industrial plants.

The Vocationist. A monthly school paper edited and printed by the students of the State Normal and Training School, Oswego, N. Y. The paper contains a practical article on the application of inlay to turned work for producing certain decorative effects, prepared by Mr. Joseph C. Park.

Industrial Training in Representative Industries. Training Bulletin No. 13, U. S. Training Service, of the Department of Labor, Washington. This pamphlet is a survey of practical value to any foreman or owner of an industrial plant who desires to know more about the establishment of training departments for employes. The pamphlet discusses the length of training, cost, records and followup work, wages, and describes the operation of training departments in such industries as rubber goods manufacturing, arsenal plants, machine tool manufacture, loom and sewing machine manufacturing, grinding machinery and hardware.

Engineering Education. F. L. Bishop. Bulletin No. 19, U. S. Bureau of Education, Washington.

The Graphic Arts. By Ralph W. Allen, instructor in drawing, Richmond Hill High School, New York City. Price, ten cents. Published by the Students' Aid Committee of the High School Teachers' Association of New York City. The pamphlet contains fifteen pages devoted to the opportunities in the field of graphic arts for skilled draughtsmen and designers. It discusses the field, the wages, opportunities for training, branches of the work in which a worker may engage, and the benefits derived by students who have been trained in the work. A list of books on design and lettering is included.

Agricultural Education. The training of teachers for a new and attractive field. By W. R. Hart. Published by the Massachusetts Agricultural College, Amherst, Mass. The pamphlet discusses the general subject of agricultural teaching courses, the field for teachers, apprentice teaching, agriculture as a life-work, and the plan under which training of these teachers is effected in the state. The supervision of the work is in charge of an agent of the state board who deals directly with the professional aspects of training in connection with the agricultural department.

Economic Reconstruction. An analysis of the main tendencies in the principal belligerent countries of Europe, with statistics on production, consumption and trade in food stuffs and industrial raw materials. By B. S. Cutler, chief of the Bureau of Foreign and Domestic Commerce. Issued by the Department of Commerce of the United States Government thru the Government Printing Office, Washington, D. C. This is a summary report on tendencies in preparation for reconstruction and after-war trade in foreign countries. The pamphlet discusses the extension of government participation in trade and industry, economic alliances, national control of essential products, preparations for the after-war period, and important statistics on the production, imports, exports, and consumption of raw materials and food stuffs in the United States and the European countries. The pamphletwill be helpful to those in need of information of this character and is especially adapted to high school and college classes in economics, trade and industry.

MR. FRANK E. MATHEWSON
President of the Eastern Arts Association.
Mr. Mathewson is head of the vocational work in the Jersey City high schools.

Home Economics. Mrs. Henrietta W. Calvin and Carrie A. Lyford, specialists in home economics, Bureau of Education. Bulletin No. 50, 1918, U. S. Bureau of Education, Washington, D. C. The pamphlet discusses the subject of home economics, its place in the school curriculum, state supervision of courses, county supervision, college and university work, the establishment of practice homes, the management of lunchrooms and cafeterias, and the conduct of child welfare courses.

Home Economics Education. By Miss Josephine T. Berry, assisted by Miss Anna E. Richardson. Bulletin No. 28, 1919, U. S. Bureau of Education. The Pamphlet discusses the general provisions of the Vocational Education Law as They Relate to Home Economics Education, the conduct of all-day schools, sequence of courses, methods of instruction, qualifications of teachers, part-time classes, evening classes and training courses for teachers.

How Training Departments Have Bettered Production. Training Bulletin No. 12, 1919, Department of Labor, U. S. Training Service, Washington, D. C. The pamphlet discusses improved production, electrical machinery manufacture after the war, training for adding machine manufacture, photographic supply manufacture, tool works, automobile building, machine shop work, airplane manufacture and cash register manufacturing.

Grade Wood Work. By Joseph F. Parks, Wichita, Kans. Price, $0.50. Printed by the Wichita High School Press, Wichita, Kans. This pamphlet covers an experience of thirteen years in teaching and supervising manual training work in the grades and high school. The outline is intended to supplement the work of the teacher and the pupil is free to consult the book while at work in the shop. The outline is based on a quarter of a day per week for Wichita pupils and should be adjusted to fit the needs of pupils in other school systems. There is a good selection of projects and a record form for the proper recording of projects and semester grades.

Industrial Training in Representative Industries. Training Bulletin No. 13 of the Training Service of the United States Department of Labor, Washington. The pamphlet gives the results of a survey of industrial training carried on in several Eastern concerns and calls attention to particular changes which have occurred in the industries because of readjustments. It shows the fallacy of haphazard industrial instruction or lack of training courses, and urges that employers establish adequate training courses as a means of promoting the interests of themselves and their employes. A study of the details of training as emphasized in the pamphlet will be of value to anyone interested in adjusting industry to the new reconstruction era.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should been closed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Phonograph Motors.

904. Q:—I am building a phonograph and wish to ask whether you would advise installing an electric motor to run it or a spring motor.—*F. L. C.*

A:—A few years ago there was an agitation for the use of electric motors in phonographs, but it died a natural death. The use of a motor is limited by several obvious considerations. In the home the electric connections are usually fixed in one place and most women like to change their furniture around occasionally. Some rooms have no plugs in the footboards and some houses are not wired. The electric motor does not run any more quietly than the later models of double spring motor. It requires the same amount of attention when running and costs more to install in the first place. Manufacturers realize these conditions and none of them feature electric motors on their machines. —*R. F. W.*

Wood Turning Course.

908. Q:—Should wood turning be continued in the mechanic arts department? If so, why?

If you had to choose between turning, printing and sheet metal, which would you take?—*G. C. K.*

A:—1. Yes, because it is an essential part of any complete wood working course and is also necessary in teaching trade courses in cabinet making and carpentry. Turning does not deserve a separate semester's work but should be woven in with other work.

2. Printing deserves first choice of the three subjects mentioned in the second part of the question. It offers by far the broadest opportunities whether the courses be general or vocational.

Placing Motor.

914. Q:—I would like to have your advice in the matter of shop machinery arrangement. It is desired to drive an emery grinder and a trip hammer by means of a jack shaft. The motor was formerly swung from the ceiling, but the whole outfit has been moved and there is no reason why motor could not be set on floor. There is plenty of room. Is this not a preferable method?—*K. W. R.*

A:—There is little difference whether a motor is installed on the floor or ceiling, provided there is a minimum of vibration and long belts can be used. With two machines run with one motor, some sort of jack shaft will be necessary in any event. Usually when placed on the floor the belts are too short to do efficient work. More slipping is experienced, it is harder on the bearings, and belts wear out more rapidly. If sufficient floor space is available to give eight or ten feet from the center of the pulley to the center of the shaft, the floor placement can be used with the same efficiency as the ceiling placement, but if not, the running of the belts from the ceiling is to be preferred.—*R. F. W.*

Stenciling.

954. Q:—I wish to know where I could get the necessary information for the painting of a stencil on a wagon box.—*F. W. M.*

A:—Stencils for painting a design on a wagon box can readily be made from tough manila paper or other kraft paper, such as is used for wrapping heavy packages. It should be cut with a sharp-pointed stencil knife, or with an ordinary pointed penknife.

After the stencil has been cut it should be saturated with boiled linseed oil and dried, and then given a thin coat of shellac on both sides. It is well to cut notches on each end of the stencil paper as a guide to insure a straight pattern when the design is repeated.

The brushes used should have flat or square ends. Japanese brushes of fine hair are preferable to bristle brushes.

The paint used should have the consistency of thick cream or thin paste, and should be free from lumps, etc.

The stenciling is done by dipping the brush lightly into the paint and rubbing it two or three times on a pallette or piece of stout paper. The paint is applied to the stencil by gently dipping the brush, sometimes called "stippling." The brush must not be rubbed as the color will be scraped off and will run under the stencil.

After using the stencil it is well to clean it with a rag dampened with turpentine or benzine. Care must be taken that the rag does not catch in the stencil and tear it. A circular movement will insure a clean, undamaged stencil.

Ice Boating.

957. Q:—Have you any plans or drawings of ice boats? —*C. W. O.*

A:—The following books will be found helpful in the construction of an ice boat:

Ashley's How to Build an Ice Yacht, $0.75, Rudder Publishing Co., New York; *Bond's Scientific American Boy*, Munn & Co., New York; *Stone's Ice Boating*, $0.70, Munn; *Adams' Outdoor Book for Boys*, Harper & Bros., New York.

CHICAGO MANUAL TRAINING TEACHERS MEET.

The Manual Arts Round Table held its closing meeting of the season on June 6th at the Pullman School of Manual Training, Pullman, Ill.

The afternoon was spent by the teachers in visiting the shops and classrooms of the school and in observing the work done during regular class hours.

The principal address was delivered by Mr. A. G. Bauersfeld, Supervisor of High School Manual Training, Chicago. Mr. Bauersfeld who spoke from wide experience as a teacher and a supervisor, gave a plan for the next year's work. This plan includes two main projects, one providing for the working out of some system of standardizing tests in shopwork; the other the working out of a course of study in electricity for the upper grades and for high schools. Mr. Bauersfeld emphasized the fact that the subject is becoming a vital one in these grades and that it has not been reduced to a regular course as drawing and wood working. Teachers, he said, are working with no connected plan, each teacher trying to teach what interests him. Boys are studying wireless who have no knowledge of the underlying principles. They skip from mountaintop to mountaintop of spectacular stunts, with no knowledge of the road thru the valley of preparation for these heights.

Several of the Pullman students demonstrated for the visitors shop problems with models and the use of lantern slides made by themselves. Some of the work in heat was remarkable for the accuracy of measurements.

Mr. Charles W. Farr, assistant county superintendent of Cook County, showed slides of farm life instruction and pointed out that this work is better understood by the farmer today. The city boy finds some use for his training when he takes a vacation job on the farm and the farmer likes to have a boy who is handy with tools and materials.

Mr. Bloodgood of Aurora, the retiring president of the association, was thanked for his tireless and efficient work during the past year.

Mr. A. P. Laughlin, Pullman School, Chicago, was elected president, and Mr. H. J. Barber of Chicago, was elected chairman of the program committee.

The final meeting of the elementary teachers which took place June 7th in the Clubrooms at the Mallers Building, consisted of a review of the past year's activities. A number of study trips were made to the principal industrial plants and to the government hospital at Fort Sheridan. About thirty teachers who have been in government service are now back in the schools.

Mr. Frank A. Perkins was elected president and Mr. Joseph R. Thompson secretary-treasurer.

The work of the next year will consist of intensive work in the shops along constructive lines. The main purpose will be to adjust the shopwork to the needs of the home and to the changed industrial conditions thruout the civilized world. *H. J. Barber.*

Miss Minta McQuiddy, supervisor of domestic science at New Albany, Ind., has been appointed dietician for the local home service department of the Red Cross. Miss McQuiddy will continue as instructor in the schools.